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~~Apar. Rm.~~

MOLINA, J.I.
C

Desert of Atacama
Paquillas
Pt. de Betas
El Chaco bajo
El Chaco Alto
Pt. del Juncal
R. Juncal
Juncal
Estero Salado
P. Chiniral
R. Chiniral
Aloxamiento
Chiniral Alto
P. de Copiapo
L.a Barlaventa
Mo di Copiapo
R. Copiapo
Copiapo
Punta Negro
B. Salada
M. del Maray
El Tolcolillo
M. del M. blanco
P. de Tortoral
El Obispo
Huasco Alto
P. del Huasco
Farellones
Huasco
Valle de Huasco
Huasco baja
Le Chepica
C. de Sal
Ly P. de Cherco
M. de S.t Fernando
P. y Pta de Tierra buena
I. de Totoralillo
I. de Merillones
I. de Pajaros
P. de Coquimbo
S. Isidro
Diogmito
La Serena
V. de el Que
Pta de la Lengua de Baca
R. Limari
Huatulame
Huinillo
M. de Illapel
Qo de Limari
M. con Min.s
S.t Rafael de Rosa
R. Chiopa
R. Illapel
M. Quilimari
R. Concheli
R. Quilimari
Filama
Mines of Petorca
P. del Governador
Longotoma
S. Felipe
Rosa
P. del Papudo
R. de Lygua
Puputun
R. Quillota
R. del Lampa
Arcay
P. de la Herradura
Quillota
Tambo
P. de Valparayso
Sta Barbara
R. Mapocho
Valparayso
Lampa
SANTIAGO
Curairano
Pto y P. de S. Antonio
R. Maypo
El Monte
I. de Tierra
Juan Fernandez I.s
Melipilla
Alhue
M. Tugungato
B. of Rapel
Pblo Pta y Altos de Topocalma
R. Rapel
Triana
P. de Navidad
S. Fernando
R. Lingua
R. Mataquito
Curico
Talca
R. Clara
Astillero
R. Maule
V. de Villa vicencio
I. de Maule
Chanco
Mercedes
P. de Humos
Chillan
P. de Huachopi
A.s de Jesus
R. Itata
Nombre de Maria
I. de la Quiriquina
Pt. de la Concepcion
LA CONCEPTION
I. de la Laja
Boca y Teras del R. Biobio
R. Biobio
I. de Sta Maria
S. Juan
Sta Fe
V. et F.s de Sta Barbara
P. de Labapie
R. Laja
R. Lebo
R. Tucapel
Mallagua
R. Tolten
R. Cautin
R. Imperial
La Mocha
R. Quillen
R. Carven
R. Tirua
I. de la Mocha
V.o de Villarica
R. Tolten
R. Queuli
S. Joseph
Qo y Morro Bonifacio
R. Callecalla
Pt. de la Galera
I. de Rauco
F. de S. Pedro
R. Bueno
Osorno
P. e Pta de S. Martin
P. de Quidal
R. Llyca
V.o de Huanehue
V.o de Osorno
V.o de Nahuel
CHILI
SOUTH
PACIFIC
OCEAN
TUCUMAN
PEHUENCHES
CHIQUILLANES
ARAUCANOS
HUILLICHES
CHONOS

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THE

GEOGRAPHICAL,

NATURAL, AND CIVIL

HISTORY OF CHILI.

TRANSLATED FROM THE ORIGINAL ITALIAN OF

Giovanni Ignazio

THE ABBE DON J. IGNATIUS MOLINA.

TO WHICH ARE ADDED,

NOTES

FROM THE SPANISH AND FRENCH VERSIONS,

AND

TWO APPENDIXES,

BY THE ENGLISH EDITOR;

THE FIRST, AN ACCOUNT OF THE ARCHIPELAGO OF CHILOE, FROM THE DESCRIPCION HISTORIAL OF P. F. PEDRO GONZALEZ DE AGUEROS;

THE SECOND, AN ACCOUNT OF THE NATIVE TRIBES WHO INHABIT THE SOUTHERN EXTREMITY OF SOUTH AMERICA, EXTRACTED CHIEFLY FROM FALKNER'S DESCRIPTION OF PATAGONIA.

IN TWO VOLUMES.

VOL. I.

PRINTED FOR LONGMAN, HURST, REES, AND ORME,

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TRANSLATOR'S PREFACE.

IMPORTANT and interesting as has ever been the History of the Spanish settlements in America, particularly to the inhabitants of the same continent, that importance and interest is at the present period greatly increased, by the occurrence of events of such magnitude, as will most probably be attended with the total severance of those colonies from Europe, and the establishment of a new empire in the west. Of these settlements, Chili is in many respects one of the most important. Blest with a soil fertile beyond description, a climate mild and salubrious in the highest degree, productive of every convenience and most of the luxuries of life, and rich in the precious metals, Nature appears to have been delighted in lavishing its bounties upon this favoured portion of the globe. In its minerals, its plants, and its animals, the naturalist will find an interesting and copious field of research; and the character of its natives fur-

nishes a subject no less curious and interesting to the moralist. The proud and invincible Araucanian exhibits some characteristic traits altogether new in the aborigines of this continent, and scarcely to be paralleled in any nation of the old. The long and successful resistance of this brave people to the arms of Spain, even in the meridian of its military glory, is a wonderful instance of what a nation can perform when animated by a spirit of liberty, and determined upon freedom or death. The Araucanians, it is true, to their high sense of independence and unyielding courage, had the good fortune of uniting a system of tactics so excellent as even to excite the admiration of their enemies, and to this in a great measure may be ascribed their successfully opposing, with far inferior arms, a powerful and disciplined foe.

Whether the peculiar character of the Araucanians proceed from the influence of climate combining with moral causes, or is wholly derived from their institutions and free form of government; whether, with the Chilians in general, they are of foreign origin, and a distinct race from the other natives of America, the remains, as the author supposes, of a great and powerful people, who had attained a high degree of civilization, and possessed a polished and copious language; or whether their agricultural knowledge, military skill, and the cultivation of their

idiom, are owing merely to fortuitous circumstances, are points of curious inquiry, and such as will afford an ample field for conjecture.

The author of the present work, Don Juan Ignatius Molina, was a native of Chili, distinguished for his literary acquirements, and particularly his knowledge of natural history, large collections in which he had made during his residence in that country. On the dissolution of the celebrated order of the Jesuits, of which he was a member, he shared the general fate of that community, in being expelled from the territories of Spain, and was, at the same time, deprived not only of his collections in natural history, but also of his manuscripts. The most important of the latter, relative to Chili, he had, however, the good fortune to regain by accident, some time after his residence in Bologna, in Italy, whither he had gone on his arrival in Europe.

Furnished with these materials, he applied himself to writing the history of that country, which was published at two different periods; the first part, comprising the Natural History, in the year 1787, and the second, containing the Civil, for reasons mentioned in his Preface, not until some years after. This work, which was written in Italian, has obtained a very high reputation on the continent of Europe, where it has been translated into the French, German, and Spanish languages. The celebrated Abbé

Clavigero, in his History of Mexico, in referring in a note to that of Chili, mentions it in the most respectable terms, and calls the author his learned friend.

In rendering this work into English, reference has been had both to the French and Spanish versions, which contain some valuable additional notes. Through the politeness of a gentleman of his acquaintance, the translator has also been furnished with an anonymous compendium of the History of Chili, printed in Bologna, in 1776, from which the supplementary notes to this volume are taken.

In addition to what is said above, the English Editor has to state, that he has, from documents in his possession, added a few occasional Notes, which are distinguished by the letters *E. E.* He has also subjoined, from Falkner's Description of Patagonia, a further elucidation of the language of the Auracanos; and two Appendixes, the first containing an Account of the Archipelago of Chiloé, from the Descripcion Historial of that Province, by P. F. Pedro Gonzalez de Agueros, printed at Madrid, in 1791; and the second, an Account of the Native Tribes who inhabit the Southern Extremity of South America, extracted chiefly from Falkner's work.

PREFACE

TO THE

NATURAL HISTORY OF CHILI.

THE attention of Europe is at this time more than ever directed to America. We are desirous of obtaining information of its climate, its natural productions, and its inhabitants; in short, every thing that is worthy of notice in that part of the world is now a subject of interest to the most enlightened nations.

Chili is acknowledged, by all who have written upon America, to be one of its provinces meriting the most attention. This country is distinguished, not so much by its extent, as by the mildness of its climate; and it may be said to enjoy all the advantages of the most favoured countries without their inconveniences.

In my opinion, it may, with propriety, be compared to Italy; as this is called the garden of Europe, that, with more justice, may be styled the garden of South America. The climate of the two countries is nearly the same,

and they are situated under nearly similar parallels of latitude. They likewise resemble each other in the circumstance of their being of much greater extent in length than in breadth, and that they are both divided by a chain of mountains. The Cordilleras or the Andes are to Chili, what the Appennines are to Italy, the source of almost all the rivers that water the country, and diffuse over it fertility and abundance. This chain of mountains has as sensible an influence on the salubrity of the air of Chili, as the Apennines have upon that of Italy; and so firmly are the inhabitants convinced of this fact, that, whenever they attempt to account for any change in the state of the atmosphere, they attribute it to the effect of these mountains, which they consider as powerful and infallible agents.

A country so remarkable, both for its natural productions, and its political state, certainly merits to be well known; yet the accounts that we have of it are merely superficial, and little is to be found, respecting its natural productions, in writers upon natural history. Of the language and the customs of the inhabitants we are equally ignorant, and scarcely any thing is known of the exertions which the Chilians have made, even in our days, to defend their liberties.

A few well-informed travellers, who have been in the country, have published some valuable accounts, but too concise to furnish a

competent idea of it. Father Louis Feuillé, a French Minim friar, has given a scientific description of the plants that he found upon the coast, to which he has added an account of several animals that he noticed there. This is a work of great merit; the descriptions are precise, and perfectly correct; but as it was published by the order and at the expense of the king, the copies of it have become very scarce, and are in the possession of but few.

A number of Spanish authors have treated of this country. The last century produced several, not to mention those of the present; but few of their writings, however, have been published, for reasons which I shall hereafter assign. Of the latter, the first in point of merit are those of Don Pedro de Figueroa, and the Abbés Michael de Olivarez and Philip Vidaurre. The two former treat of the political history of the country, from the arrival of the Spaniards to the present time. That of the Abbé Olivarez merits particular attention, from the great number of interesting facts relative to the long wars between the Spaniards and Araucanians, which he has collected with no less judgment than industry. The work of the Abbé Vidaurre is principally employed upon the natural productions and customs of Chili, and displays much intelligence and acuteness of research.

Besides the histories, or, more properly speak-

ing, the accounts that have been written of this country, there are four poems that have for their subject the Araucanian wars; also an anonymous abridgement in Italian of the Geographical and Natural History of Chili, published in 1776, which, in some respects, particularly with regard to geography and natural history, furnishes a more complete account of Chili than we have had. But as that compendium is much too concise, I presume I shall render an important service to those who feel an interest in what respects America, by presenting them with this essay, in which I have dwelt more fully and precisely upon the natural productions of Chili, as well as upon the most conspicuous events that have occurred in that country.

At an early period of life, I began to turn my attention both to the natural and political history of Chili, with the view of publishing, at some future time, the result of my inquiries. Some untoward circumstances, however, interrupted my progress, and I had even relinquished the hope of having it in my power to carry my plan into effect, when a fortunate accident put me into possession of the requisite materials, and enabled me to offer the present work to the public; to which, in a short time, I proposed adding another essay or compendium of the civil and political history of the same country.

The method that I have adopted in arranging this work, has been to divide it into four chapters: The first, after a succinct geographical account of Chili, which may serve as an introduction, treats of the seasons, winds, meteors, volcanoes, earthquakes, and state of the climate. The other three I have devoted to a description of natural objects, proceeding from the simplest to the most complex, that is, from the mineral to the vegetable and animal kingdoms; and, in the last, have added some conjectures of my own respecting the inhabitants of Chili and the Patagonians, or pretended giants, whom I consider as the mountaineers of that country.

I have referred, as far as was in my power, the various objects noticed to the genera of Linnæus, but in some instances where I have not been able to reduce them to those that are known, I have invented new, in conformity to his system. That author's mode of classification I have not, however, pursued, as it appeared to me incompatible with the plan of my work. Though I have followed the system of that celebrated Swedish naturalist, it is not from a conviction of its superiority to that of any other, but because it has been of late so generally adopted; for, great as is the respect which I feel for that learned writer, I cannot always approve of his nomenclature, and should have preferred pursuing the system of Wallerius and Bomare in mineralogy, that of

Tournefort in botany, and of Brisson in zoology, as I think them to be more simple and better known to the world in general.

In describing objects of natural history, I have avoided the use of technical terms, as being difficult to be understood by those not conversant with that study; but for the gratification of such as are familiar with that science, I have given, at the bottom of the page, the Linnæan characters in Latin, both of the known species, and of those that are new, which I have discovered*. My descriptions will, for the most part, be found to be short, and such as merely furnish the essential character of the species. The common characteristics of the genus I have passed over intentionally, and it will be found that the same brevity prevails throughout the work, which is written in a plain and unaffected manner, without bewildering myself with vague conjectures and hazardous hypotheses, which would have been deviating altogether from the limits that I had prescribed to myself.

I have frequently quoted those authors who have written upon Chili, and have judged this precaution the more necessary, as, in treating of a country so remote and so little known, I could

* *It has been thought advisable in this version to make some variation in this respect, and, conformably thereto, the technical descriptions will be found at the end of the volume, arranged under their respective heads.*....Amer. Trans.

not expect to be believed on my own unsupported assertion; but the passages that I have selected will evince that I have not exaggerated in my accounts of the salubrity of the climate, and the excellence of the soil, and that I might have been justified in saying still more.

With respect to this work, it is no more than a compendium, or an abridged history of many of the natural productions of Chili. The reflecting reader will not look in it for a complete natural history of that country; such a work would have required much greater means than I possess, and such assistance as I have not been able to procure.

Those acquainted with M. de Pauw's philosophical inquiries respecting the Americans, will perhaps be surprised to find in my work some remarks which do not correspond with what that author has said respecting America in general. But whatever I have asserted respecting Chili is founded upon personal experience and attentive observation during a residence of many years in that country; and, in support of what I have advanced, I have cited the authority of several respectable authors, who were eye-witnesses, and not hear-say relaters, of what they have written. M. de Pauw, on the contrary, not only never saw the country that he has undertaken to characterize, but even appears not to have been solicitous to consult those authors who

have written upon it; for, although he frequently mentions Frazier and Ulloa, he cites their opinions only as far as they tend to confirm his theory. Both those authors speak of Chili as very fertile, but M. de Pauw has not thought proper to insert those passages, but only observes, in general terms, that wheat cannot be raised except in some of the North American provinces.

Led away by inferences drawn from an ideal system of his own invention, he has carried his visionary notions so far that his work partakes more of the nature of a romance than a philosophical disquisition. It is sufficient for his purpose to find, in the vast extent of America, some small district or unimportant island labouring under the disadvantages of an unfavourable climate or unproductive soil, to attribute these circumstances as general to all the provinces of that country. A wretched tribe of the most obscure savages serves as his model of character for all the Americans. Such is the logic of M. de Pauw: It would be an endless task were I to endeavour to confute the numerous erroneous opinions that he has advanced respecting America; upon that subject he has deduced his conclusions from the most unfounded premises, and employed a mode of reasoning that might, with equal propriety, be applied to the prejudice of any other portion of the globe; a proceeding that can be justified neither by reason nor philosophy. In

short, De Pauw has made use of as much freedom with regard to America as if he had been writing upon the moon and its inhabitants. But to appreciate properly the observations of this author, I shall refer the reader to the opinions of many learned men who have visited that country, and have fully refuted his assertions. Among those who merit particular attention on this subject, is Count Juan Reynaldes Carli, so well known by his various literary productions, particularly his American Letters*, in which, with much critical and philosophical investigation, he has comprised whatever may serve to convey a clear and correct idea of America.

N. B. The reader is informed that the mile made use of in this work is the geographical mile of sixty to a degree, the foot the French foot, and the pound that of Italy, of twelve ounces.

* Those literati who are desirous of becoming perfectly acquainted with America, will do well to consult this work, which consists of three volumes....*Sp. Trans.*

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THE

NATURAL HISTORY

OF

CHILI.

CHAPTER I.

Situation, Climate, and Natural Phenomena.

CHILI, a country of South America, is situated upon the South Sea or Pacific Ocean, between the 24th and 45th degrees of south latitude, and the 304th and 308th degrees of longitude from the meridian of Ferro.

Its length is estimated at 1260 geographical miles, but it varies in breadth as the great range of mountains, called the Cordilleras or the Andes, approach or recede from the sea; or, to speak with more precision, as the sea approaches or retires from those mountains. Between the 24th and 32d degrees of latitude, the distance of the sea from the mountains is about 210 miles; from the 32d to the 37th it is but 120; and in the broadest part of Chili, near the Archipelago of

Chiloé, it is little less than 300 miles. In calculating from these various extents, the surface of Chili may be estimated at 378,000 square miles.

Sect. I. *Limits.*—Chili is bounded upon the west by the Pacific Ocean, on the north by Peru, on the east by Tucuman, Cujo, and Patagonia, and on the south by the land of Magellan. It is separated from all these countries by the Cordilleras, which form an insurmountable barrier on the land side, while the sea renders it secure upon that quarter. The few roads which lead to Chili from the neighbouring provinces are impassable, except in summer, and are so narrow and dangerous that a man on horseback can with difficulty pass them.*

* There are about eight or nine roads which cross the Cordilleras of Chili, of which that leading from the province of Aconcagua to Cujo is the most travelled. This road, which cannot be passed in less than eight days, is bordered on one side by the deep beds which the Chile and the Mendoza, two considerable rivers, have worn there; on the other side, by very lofty and perpendicular mountains. It is so narrow and incommodious, that, in many places, travellers are obliged to quit their mules, the only animal that can be employed, and to proceed on foot; nor does there a year pass when some loaded mules are not precipitated from these roads into the rivers. These precipices, however, do not follow the whole course of the road; for occasionally it passes over very agreeable and pleasant plains, where travellers halt to refresh themselves. In these places the Incas, when they conquered Cusco and the northern provinces of Chili, caused some stone

The extent which modern geographers assign to Chili is much greater than that which the inhabitants allow it; the former usually comprehend within it, Cujo, Patagonia, and the land of Magellan. But these countries are not only separated from it by natural limits, but their climate and productions differ; their inhabitants have countenances totally unlike the Chilians, and their language and customs have no resemblance.*

Sect. II. *Name.*—The writers upon America have given various derivations of the name of Chili, which are either wholly false, or founded on absurd conjectures. It is certain, however, that it was known by its present name long before the arrival of the Spaniards. The inhabitants derive the name from certain birds of the thrush kind, that are very common in the country, and

houses to be constructed for the accommodation of their officers: one of which has been ruined, but the others still remain entire. The Spaniards have built some more, for the greater convenience of travellers.

* Although the principal mountain of the Cordilleras is the natural termination of Chili to the east, I comprehend within its confines not only the western valleys of that mountain, as necessarily attached to it, but also the eastern; as, though not comprised within its natural limits, having been occupied by Chilian colonies from time immemorial.

whose note has some resemblance to the word Chili. And it is not improbable, that the first tribes, who settled there, considered this note as a good omen, and named the country accordingly.*

Sect. III. *Natural Divisions.*—Chili naturally divides itself into three parts, the first comprehending the islands; the second, Chili properly called; and the third, the Andes, or the country occupied by that range of mountains. The islands that belong to Chili are: the three Coquimbanes, Mugillon, Totoral, and Pajaro. These islands are desert; and are said to be six or eight miles in circumference.

The two islands of Juan Fernandez; one of these known by the name of Isola di Terra (the shore-island) from its being the nearest to the continent, is about 42 miles in circumference. Lord Anson, who remained there some time, describes it as a terrestial paradise; it is at pre-

* The colonists who went from the southern part of Chili to settle the Archipelago of Chiloé, an emigration that took place some ages prior to the arrival of the Spaniards, called those islands Chil-hue, which signifies a district or province of Chili, influenced, undoubtedly, by the desire of preserving the memory of their original country; and all the Chilians, those who have continued free as well as the subjugated, call their country Chili-mapu, that is, the land of Chili, and its language Chili-dugu, the language of Chili.

sent inhabited by the Spaniards. The other, which bears the name of Masafuera, (*the more distant*) is smaller, and although its appearance is as beautiful and inviting as that of the Isola di Terra, it has remained till the present time uncultivated and uninhabited.

The island of Carama. This is rather a rock than an island capable of cultivation. Quirinquina, at the entrance of the harbour of Conception, and Talca or Santa Maria, are two islands of about four miles in length; and are the property of two wealthy inhabitants of Conception.

Mocha. This island, which is more than 60 miles in circumference, is handsome and fertile. It was in the last century inhabited by the Spaniards, but is at present deserted.

The Archipelago of Chiloé, with that of the Chones, which is dependant upon it, comprehends eighty-two islands that are inhabited by some Spaniards and Indians. The largest of these islands, which has given its name to the Archipelago, is Chiloé; it is about 150 miles in length; the capital of it is Castro.

All these islands are near the coast, except those of Juan Fernandez, the first of which is 330, and the second 420 miles distant.*

* In the same sea, but very remote, are situated the little islands of St. Ambrosio, St. Felix, and that of Pasqua, (or

Chili properly called, or that part which is situated between the Andes and the sea, is at least 120 miles in breadth: It is commonly divided into two equal parts, that is, the maritime country, and the midland country; the maritime country is intersected by three chains of mountains, running parallel to the Andes, between which are numerous valleys watered by delight-

Easter Island) much celebrated for the great number of statues which the natives have erected in various parts of it, either as ornaments, or, what is more probable, as tutelary divinities. The two first, which are desert, are distant 200 leagues from the coast of Chili, and are situated in 26 deg. 27 min. south latitude; but that of Pasqua, which is probably the same with Davis's land, and is in 27 deg. and 5 min. south latitude, and about the 268th deg. of longitude, is 600 leagues distant from that coast. This island is but a little more than five leagues in extent, and its inhabitants, who do not exceed 800, are whiter than most of the Indians, and permit their beards to grow. The statues that are met with throughout the island are very numerous, and of various sizes; some of them being 27 feet in height, and others not exceeding that of a man. To the sight and touch they appear like stone; but as they are all of a single piece, and there are no quarries on the island capable of furnishing stones of that size, it is probable that they are formed of some kind of plaister or cement that, when dry, assumes the consistency and colour of stone. The Dutch admiral, Roggewein, who was the first that visited this island, in the year 1722, says, that these statues were wrought with much skill. Don Philip Gonsalez, commander of the ship of war Rosalia, who was there in the year 1770, and Captain Cook, in March, 1774, both agree with Roggewein as respects the number and size of these statues.

ful rivers. The midland country is almost flat; a few insolated hills only are to be seen, that diversify and render the appearance of it more pleasing.

The Andes, which are considered as the loftiest mountains in the world, cross the whole continent of America, in a direction from south to north; for I consider the mountains in North America, as only a continuation of the Cordilleras. The part that appertains to Chili may be 120 miles in breadth; it consists of a great number of mountains, all of them of a prodigious height, which appear to be chained to each other; and where nature displays all the beauties and all the horrors of the most picturesque situations. Although it abounds with frightful precipices, many agreeable valleys and fertile pastures are to be found there; and the rivers that derive their sources from the mountains,* often ex-

* The highest mountains of the Cordilleras of Chili are the Manflos, in 28 deg. 45 min. the Tupungato, in 33. 24. the Descabezado, in 35 deg. the Blanquillo, in 35. 4. the Longavi, in 35. 30. the Chillan, in 36. and the Corcobado, in 43. I had no opportunity, while in the country, to measure the height of these mountains, which naturalists assert are more than 20,000 feet above the level of the sea. Buffon asserts, that the highest mountains of the earth are to be found under the equator; but having seen and particularly noticed both those of Peru and of Chili, I doubt much the correctness of this axiom, and am more inclined to adopt the opinion of M. Bertrand, who, in his Memoirs upon the Structure of the Earth,

hibit the most pleasing as well as the most terrifying features. That portion of the Cordilleras which is situated between the 24th and 33d degrees of latitude, is wholly desert; but the remainder, as far as the 45th degree, is inhabited by some colonies of Chilians, who are called Chiquillanes, Pehuenches, Puelches, and Huilliches, but are more generally known by the name of Patagonians.

Sect. IV. *Political Divisions.*—The political divisions of Chili consist of the part occupied by the Spaniards, and that which is inhabited by the Indians. The Spanish part is situated between the 24th and 37th degrees of south latitude, and is divided into thirteen provinces, to wit: Copiapo, Coquimbo, Quillota, Aconcagua, Melipilla, and St. Jago, (which contains the capital city of the country of the same name) Rancagua, Calchagua, Maúle, Ytata, Chillan, Puchacay, and Huilquilemu.* The division of

says, "It is not true that the highest mountains are found under the equator, since the Andes increase in height in proportion as they recede from it." The Cordilleras are lower at Copiapo, notwithstanding it is nearer the tropic, than in the other parts of Chili.

* I have thought proper in this place to give a short account of the situation and extent of all these provinces, with their capitals, ports, and principal rivers. I should also have given

these provinces is very irregular, and imperfectly designated: there are some of them which ex-

a statement of their population, but was not able to obtain an estimate which satisfied me.

Copiapo—extending from the Andes to the sea, is 100 leagues in length, and 70 in breadth. Its capital—Copiapo, situate in 26 deg. 50 min. south latitude. Ports—Copiapo and Guasco. Rivers—the Salado, Copiapo, Totoral, Quebrada, Guasco, and Chollay.

Coquimbo—extending from the Andes to the sea; in length 45 leagues; in breadth 70. Its capital—Coquimbo, in 29 deg. 54 min. Ports—Coquimbo and Tongoy. Rivers—Coquimbo, Tongoy, Limari, and Chuapa.

Quillota—situated on the sea-coast, in length 25 leagues, in breadth 21. Its capital—Quillota, in 32 deg. 56 min. Ports—Papúdo, Herradura, Quintéro, and Valparaiso, in 33 deg. 2 min. Rivers—Longotoma, Ligua, Chile, and Limache.

Aconcagua—in the vicinity of the Andes; 25 leagues in length, and of equal width. Its capital—Aconcagua, in 32 deg. 48 min. Rivers—Longotoma, Ligua, and Chile.

Melipilla—on the sea-coast; 11 leagues in length, in breadth 23. Its capital—Melipilla, in 33 deg. 32 min. Port—St. Antonio. Rivers—Maypo, Maypoche, and Poangue.

Santiago—near the Andes; 11 leagues in length, in breadth 20. Its capital—Santiago, in 33 deg. 31 min. Rivers—Colina, Lampa, Mapoche, and Maypo.

Rancagua—from the Andes to the sea; in length 13 leagues, in breadth 40. Its capital—Rancagua, in 34 deg. Rivers—Maypo, Codegùa, Chocalan, and Cachapoal.

Colchagua—from the Andes to the sea; 15 leagues in length, and 43 in breadth. Its capital—St. Fernando, in 34 deg. 18 min. Ports—Topocalma and Navidad. Rivers—Rio-Clarillo, Tingiririca, Chimbarongo, Nilahue, and Teno.

Maúle—from the Andes to the sea; 44 leagues long and

tend from the sea to the Andes; others occupy but the half of that space, and are situated near the mountains or upon the coast. Their extent is also very various, some of them being six or seven times larger than others. These provinces were formerly inhabited by the Copiapins, Coquimbranes, Quillotanes, Mapochinins, Promaucians, Cures, Cauques, and Penquons. At present there exist but few remains of any of these nations.

The Indian country is situated between the river Bio-bio and the Archipelago of Chiloé, or the 36th and 41st degrees of latitude. It is inhabited by three different nations: the Arauca-

48 broad. Its capital—Talca, in 34 deg. 33 min. Port—Astillero. Rivers—Mataquito, Rioclaro, Lircay, Maúle, Putagan, Achihuenu, Liguay, Longavi, Loncomilla, and Purapél.

Itata—on the sea-coast; 11 leagues in length and 23 in breadth. Its capital—Coulemu, in 36 deg. 2 min. Rivers—Lonquen and Itata.

Chillan—near the Andes; in length 12 leagues, in breadth 25. Its capital—Chillan, in 36 deg. Rivers—Catillo, Cato, Nuble, and Chillam.

Puchacay—on the sea-coast; 12 leagues long and 25 broad. Its capital—Gualqui, in 36 deg. 42 min. Rivers—Lirquen, Andalién, and Bio bio.

Huilquilemu—near the Andes; 12 leagues long and 25 broad. Its capital—Huilquilemu, in 36 deg. 42 min. Rivers—Itata, Claro, and Laxa.

The Spaniards likewise possess the port and town of Valdivia with its territory, situated upon the south shore of the river of the same name, in 39 deg. 55 min. south latitude.

nians, the Cunches, and the Huilliches. The Araucanians do not, as M. de Pauw pretends, inhabit the barren rocks of Chili, but, on the contrary, the finest plains in the whole country, situated between the rivers Bio-bio and Valdivia. Araucania lies upon the sea-coast, and is calculated to be 186 miles in length; it is generally considered as the most pleasant and fertile part of Chili; its breadth, from the sea to the foot of the Andes, was formerly estimated at 300 miles, but the Puelches, a nation inhabiting the western part of the mountains, having joined the Araucanians in the last century, it cannot at present be less than 420 miles in breadth, and the whole of their territory is calculated to contain 78,120 square miles.

The Araucanians have divided their country into four principalities, or *uthanmapu*, to which they have given the following names: Lavquenmapu, or the maritime country; Lelvunmapu, or the flat country; Inapiremapu, or the country at the foot of the Andes; and Piremapu, or the country of the Andes. Each principality is divided into five provinces, or *ailla-rehue*, and each province into nine commanderies, or *rehue*. The maritime principality contains five provinces; Arauco, Tucapel, Ilicura, Boroa, and Nagtolten. The principality of the plain, Encol, Puren, Repocura, Maquehue, and Mariquina. The principality at the foot of the Andes, Marven, Col-

hue, Chacaico, Quecheregua, and Guanahue. The principality of the Andes comprehends all the valleys situated between the limits heretofore mentioned. The country of the Cunches extends along the coast, between the Valdivia and the Archipelago of Chiloé. Cunches is derived from the word *cunco,* which signifies a bunch of grapes, and is allusive to the great fecundity of that nation. The Huilliches occupy all the plains to the east of the Cunches, from whom they are separated partly by an imaginary line, and partly by that chain of the Andes which extends from the Valdivia to the extremity of Chili. They are called Huilliches, which signifies southern men, from their country being the farthest towards the south. Both the Cunches and the Huilliches are warlike nations, and allies of the Araucanians, to whom they have rendered important services in their wars with the Spaniards.

Chili is one of the best countries in America. The beauty of its sky, the constant mildness of its climate, and its abundant fertility, render it, as a place of residence, extremely agreeable; and with respect to its natural productions, it may be said, without exaggeration, not to be inferior to any portion of the globe. The seasons succeed each other regularly, and are sufficiently marked, although the transition from cold to heat is very moderate. The spring in Chili com-

mences, as in all the countries of the southern hemisphere, the 22d September, the summer in December, the autumn in March, and the winter in June.*

* That part of Chili which may properly be deemed a Spanish province, is a narrow district, extending along the coast from the desert of Atacamas to the island of Chiloé, above 900 miles. Its climate is the most delicious of the New World, and is hardly equalled by that of any region on the face of the earth. Though bordering on the torrid zone, it never feels the extremity of heat, being screened on the east by the Andes, and refreshed from the west by cooling sea-breezes. The temperature of the air is so mild and equable, that the Spaniards give it the preference to that of the southern provinces in their native country. The fertility of the soil corresponds with the benignity of the climate, and is wonderfully accommodated to European productions. The most valuable of these, corn, wine, and oil, abound in Chili, as if they had been native to the country. All the fruits imported from Europe attain to full maturity there. The animals of our hemisphere not only multiply, but improve in this delightful region. The horned cattle are of larger size than those of Spain. Its breed of horses surpasses, both in beauty and in spirit, the famous Andalusian race, from which they sprang. Nor has nature exhausted her bounty on the surface of the earth; she has stored its bowels with riches. Valuable mines of gold, of silver, of copper, and of lead, have been discovered in various parts of it. A country distinguished by so many blessings, we may be apt to conclude, would early become a favourite station of the Spaniards, and must have been cultivated with peculiar predilection and care. Instead of this, a great part of it remains unoccupied. In all this extent of country, there are not above eighty thousand white

SECT. V. *Of Rain, &c.*---From the beginning of spring until autumn, there is throughout Chili a constant succession of fine weather, particularly between the 24th and 36th degrees of latitude; but in the islands, which for the most part are covered with wood, the rains are very frequent even in summer. The rainy season on the continent usually commences in April, and continues until the last of August. In the northern provinces of Coquimbo and Copiapo it very rarely rains; in the central ones it usually rains three or four days in succession, and the pleasant weather continues fifteen or twenty days. In the southern the rains are much more frequent, and often continue for nine or ten days without cessation. These rains are never accompanied with storms or hail; and thunder is scarcely known in the country, particularly in places at a distance from the Andes, where, even in summer, it is seldom ever heard.* Among those mountains, and near the sea, storms occasionally arise, which, according to the direction

inhabitants, and about three times that number of negroes and people of a mixed race. The most fertile soil in America lies uncultivated, and some of its most promising mines remain unwrought.—*Robertson's History of America,* vol. iv. chap. 7.

* "Lightning is wholly unknown in the province of Chili, notwithstanding thunder is occasionally heard at a great distance over the Andes."—*American Gazetteer.*

of the wind, pass over, and take their course to the north or south.

In the maritime provinces snow is never seen. In those nearer the Andes it falls about once in five years; sometimes not so often, and the quantity is very trifling; it usually melts while falling, and it is very uncommon to have it remain on the ground for a day.

In the Andes, on the contrary, it falls in such quantities from April to November, that it not only lies there constantly during that time, but even renders them wholly impassable during the greater part of the year.* The highest summits of these mountains, which are constantly covered with snow, are distinguishable at a great dis-

* Those who venture to pass the Andes in the depth of winter, when overtaken by snow-storms are frequently frozen, as happened to the Spaniards under the command of Diego de Almagro, in the year 1535. This has led some authors to assert confidently, without attending to the difference of places, that such is the severity of the winter in Chili, that men frequently perish with cold; yet it has been repeatedly proved, that in those parts not comprised within the Andes, the weather is so mild, that it is very unusual for the mercury in Réaumur's thermometer to sink to the freezing point, and none of the rivers or streams are ever frozen. Abbé Gauri says, in his Treatise upon Natural Philosophy, that the cold is so extreme in the plains of Chili, that the inhabitants are compelled to forsake their houses, and, like the wretched inhabitants of the polar regions, to shelter themselves in caverns; a story which betrays no less ignorance of the real situation of Chili, than a total disregard of probability.

tance by their whiteness, and form a very singular and pleasing appearance. Those of the inhabitants who are not sufficiently wealthy to have ice-houses, procure snow from the mountains, which they transport upon mules. The consumption of this article is very considerable, as a general use is made of it in summer to cool their liquors. The maritime countries, being at a distance from the Andes, do not enjoy this advantage, but they feel the privation of it less, as the heat is much more moderate upon the coast than in the interior. In the midland provinces is sometimes seen, in the month of August, a white frost, accompanied by a slight degree of cold, which is the greatest that is experienced in those districts. This coldness continues two or three hours after sun-rise ; from which time the weather is like that of a fine day in spring.*

* So general is the opinion of the excessive cold in the southern extremity of America, that it is hazardous to contradict it. I shall, however, venture to suggest some doubts respecting so generally an admitted fact. At the same time that Commodore Byron compares the temperature of the Straits of Magellan in summer with the climate of England in midwinter, he describes the country in the following manner: "Upon Sandy Point we found a plenty of wood and very good water, and for four or five miles the shore was exceedingly pleasant. Over the point there is a fine level country, with a soil that, to all appearance, is extremely rich, for the ground was covered with flowers of various kinds, that perfumed the air with their fragrance; and among them were berries almost innu-

The dews are abundant throughout Chili, in the spring, summer, and autumnal nights, and in a great measure supply the want of rain during those seasons. Although the atmosphere is then

merable, where the blossoms had been shed; we observed that the grass was very good, and that it was intermixed with a great number of peas in blossom. Among this luxuriance of herbage we saw many hundreds of birds feeding, which, from their form, and the uncommon beauty of their plumage, we called painted geese. We walked more than twelve miles, and found great plenty of fine fresh water." "The place abounded with geese, teal, snipes, and other birds that were excellent food." "On each side of Sedger river there are the finest trees I ever saw." "Some of them are of a great height, and more than eight feet in diameter, which is proportionably more than eight yards in circumference; so that four men, joining hand in hand, could not compass them; among others we found the pepper tree, or Winter's bark, in great plenty. Among these woods, notwithstanding the coldness of the climate, there are innumerable parrots, and other birds, of the most beautiful plumage." "The country between Port Famine and Cape Forward, which is distant about four leagues, is extremely fine; the soil appears to be very good, and there are no less than three pretty large rivers, besides several brooks." "I made another excursion along the shore to the northward, and found the country for many miles exceedingly pleasant, the ground being covered with flowers, which were not inferior to those that are commonly found in our gardens, either in beauty or fragrance."—*Hawkesworth's Voyages*, vol. i. chap. 4.

This description is no doubt correct, and it is conformable to that given of the country by many other navigators. But how is it possible that so pleasing and plentiful a vegetation

loaded with humidity, its salubrity is not injured thereby, for both husbandmen and travellers sleep in the open air with perfect security.

Fogs are common on the coast, especially in

could be met with amidst such excessive cold, or that parrots, birds so attached to heat, should voluntarily inhabit a climate condemned to perpetual winter? And if the summer is so cold that, according to this author, it may be compared to midwinter in England, what idea must we form of the Magellanic winters. It is certain that Winter's bark is not only met with in abundance on the northern shores of this strait, but also from the account of Capt. Cook, in his second voyage, on the island of Fuego; yet this tree, which grows so plentifully in the open air, cannot endure the winter of England, whither it has been carried, unless aided by the artificial warmth of a hot-house. To which may be added, that the sea which surrounds those shores is never frozen, notwithstanding the great quantities of fresh water that flow into it; a fact which all the European navigators who double Cape Horn in midwinter can testify. In the month of June, 1768, I was myself upon a voyage in that sea, as far as the 61st degree of latitude, without meeting with the least indication of freezing; and though it snowed very often, the cold was not severer than that which is usually felt during the winter in Bologna. The floating islands of ice which are frequently met with in those seas, particularly in the summer, are driven by the southern winds which blow from the antarctic regions.

The French who, in 1765, formed a settlement upon the Maluine islands, in 51 deg. 40 min. lat. affirmed, that the winter which they passed there was by no means severe, and that the snow was never in such quantities as to cover the soles of their shoes.* I have no doubt of the unpleasant occurrence which befel Mr. Banks and his companion on the island of

* See *M. de Nerville's Letters.*

the autumn; they continue but a few hours in the morning, and as they consist only of watery particles, are not prejudicial either to the health of the inhabitants, or to the vegetation.

Sect. VI. *Winds.*—The north and north-west winds usually bring rain, and the south and south-east a clear sky. These serve as infallible indications to the inhabitants, who are observant of them, and furnish them with a kind of barometer to determine previously the state of the weather. The same winds produce directly contrary effects in the southern and in the northern hemispheres. The north and northerly winds,

Fuego; but a single fact is not sufficient to establish a theory. The crew of the Spanish ship Conception passed the whole winter of 1766 there, without experiencing any thing of a similar nature, which might have been produced by a concurrence of various accidental causes. Whenever this part of the world becomes well peopled, the cold, which is now considered as natural to it, will be very sensibly decreased; on the lands being cultivated, the air will be rendered as mild and pleasant as that which is enjoyed by the inhabitants of the northern hemisphere situated under similar parallels of latitude, it being a fact well ascertained, that a desert country covered with woods is much more subject to all the inconveniences of the atmosphere, than one filled with inhabitants, and improved by cultivation.

The account given by Julius Cæsar of the climate of France, which at that period was covered with wood and uncultivated, corresponds with that which the writers of our times have given of the Magellanic countries.

before they arrived at Chili, cross the torrid zone, and there becoming loaded with vapours, bring with them heat and rain. This heat is, however, very moderate, and it would seem that these winds, in crossing the Andes, which are constantly covered with snow, become qualified, and lose much of their heat and unhealthy properties. In Tucuman and Cujo, where they are known by the name of Sonda, they are much more incommodious and are more suffocating than even the Siroc in Italy. The southerly winds coming immediately from the antarctic pole, are cold and dry. These are usually from the south-west, and prevail in Chili during the time that the sun is in the southern hemisphere. They blow constantly towards the equator, the atmosphere at that period being highly rarified, and no adverse current of air opposing itself to their course. As they disperse the vapours, and drive them towards the Andes, it rains but seldom during their continuance. The clouds thus collected upon these mountains, uniting with those which come from the north, occasion very heavy rains, accompanied with thunder, in all the provinces beyond the Andes, particularly in those of Tucuman and Cujo, while, at the same time, the atmosphere of Chili is constantly clear, and its inhabitants enjoy their finest season. The contrary takes place in winter, which is the fine season in these provinces, and the rainy in Chili.

The south wind never continues blowing during the whole day with the same force: as the sun approaches the meridian it falls very considerably, and rises again in the afternoon. At noon, when this wind is scarcely perceptible, a fresh breeze is felt from the sea, which continues about two or three hours. The husbandmen give it the name of the twelve o'clock breeze, or the countryman's watch, as it serves to regulate them in determining that hour. This sea-breeze returns regularly at midnight, and is supposed to be produced by the tide. It is stronger in autumn and sometimes accompanied with hail. The east winds rarely prevail in Chili, their course being obstructed by the Andes. Hurricanes, so common in the Antilles, are unknown there; there exists, indeed, a solitary example of a hurricane, which, in 1633, did much injury to the fortress of Caremalpo, in the southern part of Chili.

The mild temperature which Chili almost always enjoys, must depend entirely upon the succession of these winds, as a situation so near the tropic would naturally expose it to a more violent degree of heat. In addition to these, the tide, the abundant dews, and certain winds from the Andes, which are distinct from the east wind, cool the air so much in summer that, in the shade, no one is ever incommoded with perspiration. The dress of the inhabitants of the sea-coast is the same in winter as in summer; and in the interior,

where the heat is more perceptible than elsewhere, Réaumur's thermometer scarcely ever exceeds 25 degrees. The nights, throughout the country, are generally of a very agreeable temperature. Notwithstanding the moderate heat of Chili, all the fruits of warm countries, and even those of the tropics arrive to great perfection there,*

* Contiguous to Peru is situated the province of Chili, which extends in a long, narrow strip upon the coast of the South Sea. The air is remarkably clear and serene, and for three quarters of the year this country enjoys an almost constant temperature, as it rains very little during that period. The want of rain is amply compensated by the copious dews and the many streams which, descending from the Andes, fertilize the plains, and render them productive of every kind of grain, as well as wine, oil, and all those fruits which its inhabitants, who are much reduced in their numbers, and not remarkable for their industry, think proper to cultivate. Were the government to show itself a little more favourable to the encouragement of its industry and the increase of its population, no country in the world could rival it; since, at the same time, it enjoys a clear sky and a degree of heat which, though temperate, perfectly matures those tropical fruits that do not grow spontaneously except in the torrid zone. The plains of this country furnish in abundance whatever is necessary or conducible to the comfort of life; while the mountains contain the richest treasures, in mines of gold, silver, copper, lead, iron, and quicksilver. Those that are principally wrought are the gold mines, and there is scarcely in the whole country a stream whose sands do not contain this precious metal in greater or less abundance. But the indolence of the inhabitants prevents many of the mines from being wrought, and, what is a still greater evil, the soil from being cultivated in

which renders it probable, that the warmth of the soil far exceeds that of the atmosphere. The countries bordering on the east of Chili do not enjoy these refreshing winds; the air there is suffocating, and as oppressive as in Africa under the same latitude.

Sect. VII. *Meteors.*—Meteors are very frequent in Chili, especially those called shooting stars, which are to be seen there almost the whole year, and balls of fire that usually rise from the Andes and fall into the sea. The aurora australis, on the contrary, is very uncommon. That which was observed in 1640 was one of the largest; it was visible, from the accounts that have been left us, from the month of February

the manner it deserves. Notwithstanding so few are employed in cultivation, and those by no means very industrious, a sufficient quantity of wheat for the subsistence of 60,000 persons, is annually sent from Chili to Callao, and the other ports of Peru, for there are not in the world lands more productive of every kind of grain. Besides the great quantities of wine and hemp that are exported every year, the last of which is cultivated in no other part of the South Sea, those of hides, tallow, jerked beef, gold and other metals, which constitute the most valuable cargoes, and are shipped from all the ports, are much more considerable. The chief occupation of the inhabitants is the breeding of cattle, which are so plenty, that an ox may be bought for a trifling sum; an unequivocal proof of the fertility of the country, where money is comparatively of little value.—*History of the European Settlements in America*, vol. i. part 3. chap. 11.

until April. During this century they have appeared at four different times, but I cannot designate their particular periods. This phenomenon is more frequently visible in the Archipelago of Chiloé, from the greater elevation of the pole in that part of the country.

Sect. VIII. *Volcanoes.*—That a country producing such an abundance of sulphureous, nitrous, and bituminous substances, should be subject to volcanic eruptions, is not to be wondered at. The numerous volcanoes in the Cordilleras would, of themselves, furnish a sufficient proof of the quantity of these combustible materials. There are said to be fourteen, which are in a constant state of eruption, and a still greater number that discharge smoke only at intervals. These are all situated in that part of the Andes appertaining to Chili, and nearly in the middle of that range of mountains; so that the lava and ashes thrown out by them never extend beyond their limits. These mountains and their vicinities are found, on examination, to contain great quantities of sulphur and sal-ammoniac, marcasite in an entire and decomposed state, calcined and crystallized stones, and various metallic substances.

The greatest eruption ever known in Chili was that of Peteroa, which happened on the 3d of December, 1760, when that volcano formed

itself a new crater, and a neighbouring mountain was rent asunder for many miles in extent. The eruption was accompanied by a dreadful explosion, which was heard throughout the whole country; fortunately it was not succeeded by any very violent shocks of an earthquake. The quantity of the lava and ashes was so great, that it filled the neighbouring valleys, and occasioned a rise of the waters of the Tingeraca, which continued for many days. At the same time the course of the Lontue, a very considerable river, was impeded for ten days, by a part of the mountain which fell and filled its bed. The water at length forced itself a passage, overflowed all the neighbouring plains, and formed a lake which still remains. In the whole of the country not included in the Andes, there are but two volcanoes, the first, situated at the mouth of the river Rapel, is small, and discharges only a little smoke from time to time. The second is the great volcano of Villarica, near the lake of the same name in the country of Arauco. This volcano may be seen at the distance of 150 miles, and although it appears to be isolated, it is said to be connected by its base with the Andes. The summit of the mountain is covered with snow, and is in a constant state of eruption. It is fourteen miles in circumference at its base, which is principally covered with pleasant forests. A great number of rivers derive their sources from it, and

its perpetual verdure furnishes a proof that its eruptions have never been very violent.

Sect. IX. *Earthquakes.*—The quantity of inflammable substances with which the soil of Chili abounds, rendered active by the electric fluid, may be considered as one of the principal causes of the earthquake, the only scourge that afflicts this favoured country. Another, however, not less capable, in my opinion, of producing this terrible phenomenon, is the elasticity of the air contained in the bowels of the earth, in consequence of the water which, insinuating itself by subterranean passages from the sea, becomes changed into vapour. This hypothesis will explain why the countries to the east of the Andes, at a distance from the sea, are so little incommoded by earthquakes. Two provinces however, Copiapo and Coquimbo, although near the sea, and as rich in minerals as the others, have never suffered from earthquakes; and while the other parts of the country have been violently shaken, these have not experienced the least shock, or been but slightly agitated. It is a general opinion that the earth in these provinces is intersected by large caverns. The noises heard in many places, and which appear to indicate the passage of waters or subterraneous winds, seem to confirm this opinion, and it is highly probable that by affording a free vent to the inflamed sub-

stances, these caverns may serve to counteract the progress of those convulsions to which the neighbouring country is subject.

The inhabitants usually calculate three or four earthquakes at Chili annually, but they are very slight, and little attention is paid to them. The great earthquakes happen but rarely.* The

* In a period of 244 years, from the arrival of the Spaniards to the year 1782, five great earthquakes have occurred in Chili. The first, which was in the year 1520, destroyed some villages in the southern provinces; the second, on the 13th of May, in the year 1647, ruined many of the houses of St. Jago; the third, on the 15th of March, 1657, destroyed a great part of that capital; the fourth took place on the 18th of June, 1730, when the sea was driven against the city of Conception, and overthrew its walls; and the fifth on the 26th of May, 1751, completely destroyed that city, which was again inundated by the sea, and levelled with the ground all the fortresses and villages situated between the 34th and 40th degrees of latitude. Its course was from south to north, and it was announced by some slight shocks on the preceding nights; more especially by one about a quarter of an hour before its commencement, accompanied by a ball of fire that precipitated itself from the Andes into the sea. The great shocks began about midnight, and continued four or five minutes each, but the earth was in a state of almost constant vibration until day-break. Just before the earthquake the sky was perfectly clear in every quarter, but immediately after its commencement it became covered with black clouds, which poured down a continual rain for the space of eight days, at the end of which there was a recurrence of slight tremblings that continued during a month, with short intervals between each, of fifteen or twenty minutes. It is not supposed that on

shocks were probably more violent before the inflammable materials found outlets by the means of volcanoes. At present they produce only horizontal or oscillatory motions. From a course of accurate observations it has been ascertained, that earthquakes never occur unexpectedly in this country, but are always announced by a hollow sound proceeding from a vibration of the air; and as the shocks do not succeed each other rapidly, the inhabitants have sufficient time to provide for their safety. They have, however, in order to secure themselves, at all events, built their cities in a very judicious manner; the streets are left so broad, that the inhabitants would be safe in the middle of them, should even the houses fall upon both sides.

In addition to this, all the houses have spacious courts and gardens, which would serve as places of refuge. Those who are wealthy, have usually in their gardens, several neat wooden barracks, where they pass the night whenever they are threatened with an earthquake. Under these circumstances, the Chilians live without apprehension, and consider themselves in perfect security; especially, as the earthquakes have never been hitherto attended with any considerable

this occasion a single person perished in the whole province, excepting seven invalids, who were drowned in the city of Conception; and the loss of lives, if any, was no greater in the preceding earthquakes.

sinking of the earth, or falling of buildings. This, in my opinion, is owing to subterranean passages communicating with the volcanoes of the Andes, which are so many vent-holes for the inflamed substances, and serve to counteract their effects. Were it not for the number of these volcanoes, Chili would, in all probability, be rendered uninhabitable.

Some pretend that they can foretel an earthquake from certain changes in the atmosphere. Although this does not appear to me impossible, I must acknowledge that my own experience has furnished me with nothing to induce me to credit it. I was born and educated in Chili, and while in that country paid great attention to the state of the air during earthquakes: I have known them occur both in the rainy and dry seasons, during a storm as well as a calm.

Sect. X. *Salubrity of Climate.*—The inhabitants of Chili, notwithstanding the frequent occurrence of earthquakes, are very well satisfied with their country, and I am convinced would not readily be induced to quit it for any other exempt from this calamity.

This preference is not founded solely upon that natural attachment to country, which is common to all men, but is derived from some advantages peculiar to Chili; a soil naturally fertile, and well adapted to every useful and

valuable production, a mild and almost equable temperature of climate, and a remarkable salubrity, are the blessings enjoyed by this delightful country.* Before the arrival of the Spa-

* If Chili is not populous, it cannot be attributed to the fault of its climate, which is one of the most salubrious of any known, the contiguity of the Cordilleras communicating to it a delightful temperature, which, from its latitude, it could not be expected to enjoy. Nor does Spain possess a province more pleasant and agreeable as a place of residence.—*Philosophical History of the European Establishments*, book viii. chap. 2.

There are two reasons which have impeded the population of Chili, and counterbalanced the advantages it has received from nature: The first, the almost continual wars between the Spaniards and the Araucanians from its first discovery, which have destroyed an infinite number of people: The second (and the principal) the commercial restrictions which were imposed upon that country, as for a century the Chilians had no direct communication with Europe, nor were they permitted to send any of their produce to any other place than Calcao, from whence it followed, that every species of exportation and importation was conducted by the merchants of Peru, who of course reaped all the profit of this trade. This pernicious system discouraged industry, and had a sensible effect upon the population; but of late, since a direct commerce has been carried on with European ships, which arrive every year in some of the ports of Chili, that delightful country begins to increase in numbers, and, in some measure, to raise itself to that important station which its natural advantages claim. In the year 1755, in the province of Maúle alone, there were calculated to be 14,000 whites capable of bearing arms, and the population of the other provinces had increased in a degree proportionate to the extent of their limits. The esti-

niards contagious disorders were unknown: the small pox, which occasionally makes its appearance in the northern provinces, and is known by the name of the plague, was first introduced by them.* At such times, the inhabitants of the neighbouring provinces oblige every person coming from the infected district to perform a rigorous quarantine, and by that means have preserved themselves from the ravages of that destructive malady. Whenever the Indians suspect any one to be attacked with it, which sometimes happens from their intercourse with the Spaniards, they burn him in his own hut,† by

mates, therefore, made by Dr. Robertson and the Abbé Raynal, in their histories, are, in this particular, incorrect, being founded on accounts furnished during the last century.

* The small pox raged in Peru *before* the Spaniards entered it; just when Pizarro was first off the coast, and had landed his two men. The Inça died of it. Whence did this come?—Perhaps it had spread from Mexico.—*E. Editor.*

Herrera, 5. 3. 17.

† In Abyssinia also, whenever a house is supposed to be infected with the small pox, the people set fire to it, and burn it with all its inhabitants!—*E. E.*

The most striking picture of the ravages of this dreadful malady among savage tribes, is given by Mackenzie.

It spread around with a baneful rapidity which no flight could escape, and with a fatal effect that nothing could resist. It destroyed with its pestilential breath whole families and tribes, and the horrid scene presented to the beholders a combination of the dead, the dying, and such as to avoid the hor-

means of fiery arrows. By this method, which is truly a violent one, they have hitherto prevented its progress, and been exempted from this disorder.

A physician of the country, Matthias Verdugo, a monk of the order of St. John, was the first who, in 1761, introduced inoculation, and since that period it has been practised with great success. Tertian and quartan fevers are also unknown there; and the inhabitants of the neighbouring provinces who are afflicted with them,

rid fate of their friends around them, prepared to disappoint the plague of its prey by terminating their own existence.

The habits and lives of these devoted people, which provided not to-day for the wants of to-morrow, must have heightened the pains of such an affliction, by leaving them not only without remedy, but even without alleviation.

To aggravate the picture, if aggravation were possible, may be added, the putrid carcases which the wolves dragged forth from the huts, or which were mangled within them by the dogs, whose hunger was satisfied with the disfigured remains of their masters. Nor was it uncommon for the father of a family whom the infection had not reached, to call them around him, to represent the cruel sufferings and horrid fate of their relations, from the influence of some evil spirit who was preparing to extirpate their race, and to invite them to baffle death with all its horrors by their own poniards. At the same time, if their hearts failed them in this necessary act, he was himself ready to perform the deed of mercy with his own hand, as the last act of his affection, and instantly to follow them to the common place of rest and refuge from human evil.—*Mackenzie.*

are accustomed to come into Chili for the benefit of their health, where they very soon recover. A violent fever, accompanied with delirium, is sometimes prevalent among the country people, particularly in summer and in autumn. This complaint, which the Indians cure with certain herbs, whose properties they have learnt by experience, bears the name of *chavo longo*, which signifies the disorder of the head. The venereal disease is but little known in the Spanish settlements, and still less among the Indians. As the last have no word in their language expressive of it, there is every reason to presume that this malady was not known among them until after the arrival of the Spaniards. The rickets, a disease which for three centuries has been a scourge to Europe, is as yet unknown within the boundaries in Chili, and lame or deformed persons are very rarely to be met with.* To many of the

* The Creoles are generally well shaped, and there are scarce any of those deformed persons, so common in other countries, to be seen among them; besides which, they almost all possess great flexibility and activity of limbs.—*Philosophical History*, book xi. chap. 18.

Not only the Creoles, who are descended from the Europeans, but also the aborigines of the country, display equal perfection of form. Some authors pretend, that the reason why none who are deformed, or cripples, are to be found among these people, is owing to the savage custom which the parents have of destroying such unfortunate children at their birth; but this is a mere picture of the imagination; at least, among

maladies, peculiar to hot countries, such as the Siam fever, the black vomit, and the leprosy, its inhabitants are likewise equally strangers. No instance of the hydrophobia has ever occurred, and M. de la Condamine justly observes, that in South America the dogs,* cats, and other animals are never afflicted with madness.

Chili produces none of those dangerous or venomous animals which are so much dreaded in hot countries; and it has but one species of small serpent, which is perfectly harmless, as the French Academicians ascertained when they went to Peru, in 1736, to measure a degree of the meridian.† The lions, which are sometimes met with in the thickest and least frequented forests, are distinguished from the African lion, both by their being without hair, and their timidity; there is

the Chilians no trace of so inhuman a practice has ever been discovered, as numbers who have lived with them for years have positively assured me.

* This fact is certain. Does it not follow that this dreadful malady is never generated without infection, and therefore that it is possible to annihilate it?—*E. E*

† This country is not infested by any kind of insect except the chiguas or pricker, or any poisonous reptile; and although in the woods and fields some snakes are to be found, their bite is by no means dangerous; nor does any savage or ferocious beast excite terror in its plains.—*Ulloa's Voyage*, part ii. vol. 3.

no instance of their ever having attacked a man, and a person may not only travel, but lie down to sleep with perfect security, in any part of the plain, and even in the thickest forests of the mountains. Neither tigers, wolves, nor many other ferocious beasts that infest the neighbouring countries, are known there. Probably the great ridge of the Andes, which is every where extremely steep, and covered with snow, serves as a barrier to their passage. The mildness of the climate may also be unfavourable to them, as the greater part of these animals are natives of the hottest countries.

CHAP. I.

Waters, Earths, Stones, Salts, Bitumens, and Metals.

Chili is a plane very perceptibly inclined towards the sea, and may be considered as a prolongation of the western base of the Andes. From its situation it naturally receives the waters produced by the melting of that immense body of snow that annually falls upon those mountain, while the provinces to the east are frequently in want of water. The number of rivers, streams, and springs, which irrigate the country, is inconceivable. They are to be found in every part, even on the tops of some of the maritime mountains.

Sect. I. *Rivers.*—It is difficult to determine the number of rivers and streams that have their sources in the Andes; the principal, however, amount to one hundred and twenty-three, fifty-two of which communicate directly with the sea, and convey thither the waters of all the others. Although, from the inconsiderable breadth of the country, the course of these rivers is short,

there are several of them that are navigable at least half their distance for ships of the line. Of this number are, the Maúle, in the province of the same name; the Bio-bio, which is two miles in breadth; the Cauten; the Tolten; the Valdivia, in the country of Arauco; the Chaivin; the Rio-bueno, in the country of the Cunches; and the Sinfondo,* which discharges itself into the Archipelago of Chiloé.

The course of these rivers is extremely rapid as far as the maritime mountains, where, from the make of the ground, they flow more slowly. The beds are very broad, their bottoms generally stony, and the banks low.

This last circumstance is of great service to the husbandmen, who avail themselves of it to let the water into canals, from which, in times of drought, they water their fields; by this means they are never in want of water, even in the dry season, as the rivers are then always full, in consequence of the melting of the snow on the Andes at that period.†

* Probably so called from its depth.—*E. E.*

† The rivers which water and fertilize the whole country upon the western side of the Andes, from whence they spring, are very numerous, and discharge themselves into the Pacific Ocean. The banks, covered with beautiful trees that always retain their verdure, and the clearness and coolness of so many crystal streams, render this country the most delightful in the

From the latter part of September to February, the water in these rivers is at its greatest height; their rise is, however, by no means uniform, since some of them are observed to increase most in the morning, others at mid-day, and others towards evening; a circumstance which may probably be owing to the greater or less exposure of their springs to the sun. Notwithstanding these floods are copious, they never inundate the adjacent plains, from the beds of the rivers being, as I have already observed, very broad. Though many of these streams appear to be shallow, frequent instances have occurred of persons being drowned who have attempted to ford them on horseback. The common opinion that snow-water produces goitres, appears to be *unfounded, if we may be allowed to form a judgment from that of these rivers. Their waters

world. Its thermal and mineral waters likewise contribute much to the health of the inhabitants.—*Coleti's Dictionary of South America*; article CHILI.

*There is a passage in the *Coroneca del Orden de S. Augustin en el Peru*, by M. F. Antonio de Calancha, which mentions goitres as common among some of the Peruvian mountaineers. I made no reference to this fact, not supposing that I should ever want to refer to it; the book has no other Index than an absurd one of all the texts of scripture which it quotes; and I want leisure, as well as inclination, again to examine a volume containing more than 900 large and full folio pages, with about two lies to every page.—*E. E.*

which are excellent, and constantly drank by the inhabitants, cannot be considered as any thing but liquefied snow, yet is this disease wholly unknown in Chili.

Sect. II. *Lakes.*—Lakes of salt and fresh water are common in Chili. The first are situated in the marshes of the Spanish provinces; the most remarkable are the Bucalemu, the Caguil, and the Bojeruca, which are from 12 to 20 miles in length. Those of fresh water are contained in the interior provinces, and are the Ridaguel, the Aculeu, the Taguatagua, the Laquen, and the Nahuelguapi; the two latter, situated in the country of the Araucanians, are the largest. The Laquen, which the Spaniards call the lake of Villarica, is 72 miles in circumference, and in the centre of it rises a beautiful little hill in the form of a cone. The Nahuelguapi is 80 miles in circumference, and has likewise in the middle a pleasant island covered with trees. These lakes are the sources of two considerable rivers; the first of the Talton, which falls into the Pacific Ocean; the latter of the Nahuelguapi, which empties itself into the Patagonian Sea, near the straits of Magellan. Within the Andes are also many lakes, but they are of little importance.

Sect. III. *Mineral Waters.*—A country like

Chili, abounding in mineral and bituminous substances, must necessarily produce a great number of mineral springs, the virtues of whose waters must have become known to the inhabitants. Gaseous and acidulated waters are common in all the provinces, particularly in the valleys at the foot of the Andes. Some springs are vitriolic and impregnated with iron, others sulphuric or muriatic; their temperature is in general that of the atmosphere; but there are some that are cold in summer, a quality probably derived from their sources being in the vicinity of mines or springs of salt. But as I have never carefully analyzed these waters, I am not able to give accurate information respecting them.

The provinces of Copiapo and Coquimbo are rich in salt springs. In the former, there is a river called from its saltness *Salado*, which, like the other large rivers, has its source in the Andes, and falls into the Pacific Ocean. The water of this river is very clear and extremely salt; and its specific gravity is, according to the season of the year, from fifteen to eighteen degrees.

The salt crystallizes naturally upon the shores; it is excellent and fit for use without any preparation, as it is very pure and not mixed with calcarious earth, or any heterogeneous salts. In a valley of the Andes, inhabited by the Pehuenches, in 34 deg. 40 min. latitude, are eleven springs of very clear and limpid water, which

overflows the surface, and becomes crystallized into a salt as white as snow. This valley is about fifteen miles in circumference, and is entirely covered, for the depth of six feet, with a crust of salt, which is collected by the inhabitants in large pieces, and used for all domestic purposes. The surrounding mountains afford no external indication of mineral salt, but they must necessarily abound with it, from the great quantities deposited by these springs.

Mineral waters are common in Chili. The most celebrated are those of the Spanish settlements of Peldehues and Cauquenes. The source of the former is on the summit of one of the exterior mountains of the Andes, to the north of St. Jago. It consists of two springs of very different temperatures, one hot, and the other cold; the former is sixty degrees above the freezing point by Réaumur's thermometer, the latter four degrees below it. They are about eighty feet distant, and their waters are united, by means of canals, so as to form a tepid bath, which is found very efficacious in many disorders. The water of the hot spring is oily to the touch, and foams like soap suds; it abounds with mineral alkali, which appears to be combined with an unctuous substance in a state of solution. It is clear, inodorous, impregnated with a very little fixed air, and its specific weight is but two degrees above that of common distilled

water. Its heat is probably owing to the effervescence of a large body of pyrites in the vicinity of its source. The water of the cold spring is iron and vitriolic, and, when mixed with that of the warm, deposits Glauber's salt and a yellowish ochre.

The baths of Cauquenes are in one of the valleys of the Cordilleras, near the source of Caciapoal, a very considerable river. As the situation is very pleasant, great numbers of persons resort there during the summer, as well for amusement as for the recovery of health.

The springs are numerous and of various qualities and temperatures. Some of them are cold, others hot; some acidulated, and impregnated in a greater or less degree with iron; while others are alkalescent or vitriolic, and several, like those of Pisa, are merely gaseous. The principal spring is very warm and sulphuric; its margin is covered with a yellow efflorescence of sulphur, and the water has a strong hepatic smell; it contains besides an alkali and a neutral salt. The surrounding mountains abound with every kind of mineral, and near the spring are great numbers of willows, which are covered with a species of manna, in globules of the size of grains of gun-powder.

Three mineral springs, adjoining the high road to Cujo, afford a neutral salt, with a calcareous base, of a sharp and bitter taste, and

easily soluble; it is collected in great quantities upon the borders of these springs, where it shoots into crystals that are usually of a quadrangular prismatic form. The inhabitants use it for Glauber's salt, which they believe it to be; but I am more inclined to think it a species of Epsom salt, as it has neither the base nor the form of the true Glauber, yet, as I have never had an opportunity of analyzing it critically, I cannot determine with positiveness. Mineral waters are in great estimation with the Araucanians, who consider them as peculiarly beneficial, and as under the particular care and protection of *Meulén*, one of their benevolent deities, whom they call *Gencovunco*, or, *Lord of the mineral waters.*

Sect. IV. *Soil.*—The soil of Chili is wonderfully fertile; its fertility is not, however, equal throughout the country, but is increased in proportion to its distance from the sea.* The maritime are less productive than the middle districts, and the latter are inferior in quality of soil to the valleys of the Andes. In these last, the vegetation is more luxuriant and vigorous, and the animals larger and stronger than in the other

* The plains, the mountains, the valleys, in short, all Chili, without exception, is an object of wonder; since from its extreme fertility, it would seem as if every particle of earth was converted into seed.—*American Gazetteer*; article Chili.

parts of the country; but as the people who inhabit these rich valleys are Nomades, or herdsmen, and in reality cultivate nothing, it is difficult to determine with precision the degree of their fertility. The various salts and other principles of fecundity contained in these mountains, and by means of the air and the rivers distributed throughout the country, combining with the natural heat of the soil, may be considered as the real causes of that inexhaustible fertility which requires not the aid of manure. The husbandmen have discovered by experience that all artificial manures are superfluous, if not injurious; they allege in proof the great fertility of the land in the vicinity of St. Jago, which, notwithstanding it has never been manured since the settlement of the Spaniards, a period of two hundred and thirty-nine years, though constantly cultivated by them, and for an unknown time by the Indians before them, has lost nothing of its productive properties.

Another advantage resulting from the richness of the soil is, that Chili is not infested with those worms so destructive to grain in the blade, which are produced or multiplied by the fermentation and putrefaction of manure.

Those who have written upon Chili are not agreed as to the product of the soil. Some say that it yields from sixty to eighty, and even a

hundred fold;* others, that the crop is considered as poor if it does not exceed a hun-

* The river of Chile, called also the river of Aconcagua, from its rising in a valley of that name, is celebrated for the prodigious quantity of wheat which is every year produced upon its shores; from whence, and the vicinity of St. Jago, is brought all the grain exported from Valparaiso to Callao, Lima, and other parts of Peru. Such is the quantity, that it is inconceivable to any one unacquainted with the excellence of the soil, which usually yields from sixty to eighty for one, how a country so thinly peopled, whose cultivable lands are comprised within a few valleys of not more than ten leagues square, can furnish such quantities of grain in addition to what is wanted for the support of the inhabitants. During the eight months while we were at Valparaiso, there sailed from that port alone thirty vessels loaded with wheat, each of which would average six thousand *fanegas,* or three thousand mule loads, a quantity sufficient for the subsistence of sixty thousand persons for a year.—*Frazier's Voyage,* vol. i.

Besides the commerce of hides, tallow, and dried beef, the inhabitants of Conception carry on a trade in wheat, with which they annually load eight or ten ships of four or five hundred tons burthen for Callao, exclusive of the flour and ship bread for the supply of the French ships that stop at Peru on their return to France. But all this would be little for this excellent country, if the earth was properly cultivated, which is so fertile and easy of tillage, that the inhabitants merely scratch it over with a plough, or more frequently with the crooked branch of a tree, used for that purpose, drawn by a pair of oxen; and so prolific is the soil, that, for the purpose of vegetation, the seed scarcely requires a slight covering, and will yield a hundred for one.—*Ibid.*

dred ;* while there are those who assure us that it often amounts to three hundred for one.† I am not disposed to question the account of respectable writers, several of whom have been eye witnesses of what they describe: especially, as instances of fertility occasionally occur that are truly wonderful. I have myself seen lands that produced a hundred and twenty, and even a hundred and sixty for one, but these are extraordinary cases, and cannot serve as data for a general estimate.

The common crop in the middle districts is

* Another more important source of wealth, although less appreciated by its possessors, is what arises from the fertility of the soil, which is truly astonishing. All the European fruits attain perfection in this favoured climate, and the wines would be excellent were it not for a bitter taste acquired in consequence of their being kept in jars smeared with a kind of rosin, and afterwards put into skins for transportation. When the crop of grain does not exceed an hundred for one, it is considered as poor and scanty.—*Philosophical History*, book viii.

It is not a good year when the crop of wheat does not exceed a hundred for one, and it is the same with all other grain. —*Ulloa's Voyage*, vol. iii.

† The soil is excellent, but differing, in some degree, as it approaches or recedes from the equator. The valleys of Copiapo frequently yield three hundred for one; the plains of Guasko and Coquimbo, are nearly as productive, and the lands on the river Chile are so fertile that they have given its name to the country.—*Sanson's (of Abbeville) Geography*; article CHILI.

from sixty to seventy for one, and from forty to fifty in the maritime. Between the 24th and 34th degrees of latitude the husbandmen irrigate their fields by artificial means, which renders their crops generally more certain than in the southern provinces, where they depend upon the dews, although the rivers and streams offer them the same advantages. The estimate which I have made, might, however, be increased, were the grain which is lost during the harvesting to be taken into account; as the husbandmen have adopted a very injurious custom of not reaping their corn until it begins to shell out, in consequence of which much is wasted and serves as food for the birds; and it happens not unfrequently, that what is left produces a second crop without any tillage or farther sowing of the ground.

The difference in the vegetation of the maritime and middle provinces depends upon the qualities of their respective soils. That upon the coast resembles the rich grounds of Bologna; its colour is brown, inclining to red, it is brittle, clayey, contains a little marle, and is filled with flint, stones, pyrites, shells, and other marine substances. In the interior, and in the valleys of the Andes, the soil is of a blackish colour, inclining to yellow; it is brittle, and frequently mingled with gravel and marine substances in a state of decomposition. This quality of the

soil is continued to a considerable depth, as is discoverable in the ravines and beds of the rivers.

Sect. V. *Physical Organization.*—The marine substances that are met with in every part of Chili, are incontestible proofs of its having been formerly covered by the ocean, which, gradually retiring, has left the narrow strip of land extending from the shore to the Andes.* Every

* The retrocession of the sea from the coast of Chili is every year very perceptible, although not the same in every part. In some places it does not exceed two inches, while in others, especially at the mouths of the rivers, it is more than half a foot. This circumstance, apart from other more general causes, is most probably owing to the shoals produced by the flowing of so many large rivers into the sea; these consist the first year only of a light sand, in the second they produce a little grass, and in the third are entirely clothed with verdure. To this cause is the conformation of the shores assignable, which consist in general of a plain two leagues broad between the sea and the maritime mountains. Upon the western declivities of these mountains, the vestiges of the ocean are still very perceptible; they are excavated in various modes, and exhibit many singular grottos, containing rooms hung with shells and beautiful spars, which afford shelter to the cattle during the heats of summer. On the left bank of the river Maúle, at four hundred paces distance from its mouth, is an insulated mass of white marble, consisting of a single piece, seventy-five feet in height, two hundred and twenty-four in length, and fifty-four in breadth. This immense block, called from its appearance, *the church*, is excavated within like an arch the third part of its height, and has on the outside

thing within these limits offers incontestible proofs, that the land has been for a long time covered by the ocean; the three parallel chains of maritime mountains, the hills that unite them with the Andes, in fine, all the ramifications of

three doors of a semi-circular form, and proportionate height and breadth. Through the one on the western front, the sea continually flows; the two others, which are on the north and south sides, and placed opposite, serve to admit those who wish to visit it at the tide of ebb. This natural edifice, constantly washed by the sea, serves as a place of resort for the sea-wolves, who herd in great numbers in the lower part, and make the cavity re-echo with their lugubrious cries; while the upper is occupied by a species of sea-bird, very white, called *lili*, in figure and size resembling a house-pigeon. On the shore of the province of Rancagua, at a short distance from the sea, is a mass of stone, excavated in a similar manner, called by the inhabitants *the church of Rosario.* Grottos and caverns of this sort are very numerous in the Andes, and of great extent. In the mountains near the source of the river Longavi, is a cavern of an oval form, and so large that it will readily admit a man on horseback; but what renders this cave particularly remarkable is, that at sunrise, before the summits of the Andes are tinged by its beams, the rays of that luminary, penetrating through some aperture, presents to the eye a wonderful phenomenon. In the same range of mountains is, likewise, the celebrated bridge of the Inca, which is nothing but a large mountain, cut through by the river Mendoza. This mountain principally consists of gypsum, and large clusters of beautiful stalactites, formed by the crystallization of that substance, are suspended from the arch of the bridge.

the latter appear to have been successively formed by the agency of its waters.

The interior structure of the Andes every where exhibits a very different origin, and appears to be coeval with the creation of the world. This immense mountain, rising abruptly, forms but a small angle with its base; its general shape is that of a pyramid, crowned at intervals with conical, and, as it were, crystallized elavations. It is composed of primitive rocks of quartz of an enormous size and almost uniform configuration, containing no marine substances, which abound in the secondary mountains. On the top of Descabezado, a very lofty mountain in the midst of the principal chain of the Andes, whose height appears to me not inferior to that of the celebrated Chimboraso of Quito, various shells, evidently the production of the sea, oysters, conchs, periwinkles, &c. are found in a calcined or petrified state, that were doubtless deposited there by the waters of the deluge.

The summit of this mountain, whose form appears to be owing to some volcanic eruption, is flat, and exhibits a plain of more than six miles square; in the middle is a very deep lake, which, from every appearance, was formerly the crater of a volcano.

The principal chain of the Andes is situated between two of less height that are parallel to it. These lateral chains are about twenty-five

or thirty miles distant from the principal, but are connected with it by transverse ramifications, apparently of the same age and organization, although their bases are more extensive and variegated. From the lateral ridges many other branches extend outwardly, composed of small mountains, occasionally running in different directions.

These external mountains, as well as the middle and maritime, are of a secondary formation, and an order essentially different. Their summits are generally more rounded, and they consist of horizontal strata of various substances and unequal thickness, which abound with marine productions, and often exhibit the impressions of animals and vegetables. I have observed both in excavations formed by the water, and those made by the inhabitants, that the inferior stratum of these mountains is generally a kind of whetstone, of a reddish colour and a sandy grain, sometimes a quartzeous sand, or a compact dark grey sandstone; this is succeeded by layers of clay, marle, various kinds of marble, schistus, spar, gypsum, and coal; beneath the whole are found veins of ore, ochre, quartz, granite, porphyry, sand, and rocks of various degrees of hardness.

The disposition of the strata varies very considerably in different places, and in these derangements the laws of gravitation are seldom ob-

served, as what forms the upper stratum in one mountain, I have discovered to be the inferior in another. They in general, however, preserve a degree of regularity in their inclination, which is from south to north, a little tending towards the west, corresponding with the relative situation of the ocean, whose currents are from south to north.

Notwithstanding these mountains in general are composed of various strata, there are several that are uniform ; some are entirely calcareous, others are of gypsum, of granite, of freestone, of quartz, of basaltes, of lava, and other volcanic substances; while, as Ulloa justly observes, some appear to consist entirely of shells, scarcely, if at all, decomposed. But all these homogeneous mountains are barren, and produce only a few languid shrubs, while the stratified mountains, which are covered with a depth of cultivable soil, are always clothed with a plentiful and vigorous vegetation.

The exterior of the stratified mountains likewise furnishes a proof of their formation by the ocean. Their bases are almost always very extensive, heightening progressively and forming various valleys, whose inflections are correspondent to the undulation of the waves. On examining the valleys, their organization is readily perceived to be the same with that of the stratified mountains: similar ma-

terials, and a like disposition of them, are found every where, though, in general, more pulverized or reduced to earth.

The variety of fossils with which the earth abounds, must necessarily add to the value of this delightful country; and although at present the precious metals appear to attract the sole attention and regard of the inhabitants, there will doubtless be a time when, stimulated by science, they will apply themselves to the discovery of various minerals not less worthy of attention.

Sect. VI. *Earths.*—If Nature has been prodigal of the precious metals to Chili, she has not been sparing in the variety of its earths. Under different modifications, I have discovered both the argillaceous, the calcareous, the sandy, and the mineral. It contains all the kinds of clay described by Linnæus and Wallerius, excepting the flesh-coloured clay, or *terra lemnia*; but, in place of this, I have met with five other kinds that appear to me to be entirely distinct from those of Linnæus.

The first of these is the clay of Buccari, (argilla Buccarina). It is a species of bolar earth found in the province of St. Jago. It is very fine and light, of an agreeable smell, and of a brown colour spotted with yellow, dissolves readily in the mouth, and like all

those kinds of earth, adheres strongly to the tongue. In many of the convents of the capital, the monks manufacture from this clay, jars, bottles, cups, and several other articles of beautiful ware, which they varnish and paint very handsomely, on the outside, with the figures of plants and animals.

These vessels communicate a very pleasant smell and flavour to the water that is put into them, which undoubtedly proceeds from the solution of some bituminous substance contained in the clay. But as no appearance of bitumen is perceptible in the vicinity of the pits from whence it is procured, its qualities can only be ascertained by analyzation. Considerable quantities of this ware are exported to Peru and Spain, where it is held in great estimation, and known by the name of Bucaros. The Peruvians eat the broken pieces of these vessels as the natives of Indostan do those of Patna.

The second kind is the clay of Maúle (argilla Maulica). This clay is as white as snow, smooth and greasy to the touch, extremely fine, and sprinkled with brilliant specks. It is found on the borders of rivers and brooks in the province of Maúle, in strata which run deep into the ground, and its surface when seen at a distance has the appearance of ground covered with snow, and is so unctuous and slippery that it is almost impossible to walk upon it without falling. It

does not effervesce with acids, and instead of losing in the fire any portion of its shining whiteness, it acquires a slight degree of transparency. From its external appearance, when I first saw this clay, I supposed it a kind of fuller's earth very common in the country; but I afterwards discovered that it was not lamellous, was easily wrought, and retained the form that was given it, and, although saponaceous to the touch, did not foam with water. These circumstances induce me to believe that this clay is very analogous to the *kaolin* of the Chinese, and that combined with fusible spar, of which there are great quantities in the same province, it would furnish an excellent porcelain.

The third species is the subdola (argilla subdola) so called from the places where it is found, which are usually marshes, containing pits very dangerous for animals, especially horses, who, if they fall in them, are sure to perish unless immediate assistance is obtained. This clay is black, viscous, and composed of coarse particles of various sizes; the pits are from fifteen to twenty feet in circumference, and of an immense depth. Wallerius and Linnæus describe a clay, found in Sweden, that has resemblance to this, to which they have given the name of *argilla tumescens*, but on investigation it appears to be very different both in its colour and properties. The Chilian clay is a little

alkalescent, continues in the same state throughout the year, and is constantly covered with a very fine verdure that attracts the animals, who are frequently mired and perish in it; while that of Sweden inclines to an acid, swells much in certain seasons, and is naturally barren.

The fourth kind is the rovo (argilla rovia) from which the inhabitants procure an excellent black; it is used in dying wool, and represented by Feuillé and Frazier as superior to the best European blacks. This clay is of a very fine grain, of a deep black, a little bituminous, and very vitriolic. It is found in almost all the forests, and has the property of communicating to pieces of wood that are buried in it for a short time, a sort of black varnish, very shining and durable. The colour is obtained by boiling the clay with the leaves of a plant called the *panke tinctoria,* hereafter described.

They grey clay, which is the fifth species, posseses all the properties requisite for pottery. It appears to be of a kind suitable for retorts, crucibles, &c. as the vessels that I have seen of it are very strong, and capable of resisting the most violent fire.

Among the calcareous earths is a kind of lime or gravelly chalk, found in the Cordilleras, in quarries of many miles in extent, and of a depth hitherto unexplored. I have given it the name of volcanic lime (calx vulcanica) as I am con-

vinced it was originally marble reduced to this state by volcaneos or subterranean fires. Its surface appear to have been burnt, and the surrounding mountains afford unequivocal proofs of an extinguished volcano.

This substance is distinguished from common lime by several particulars: it is not so caustic even when burnt; and, when mixed with acids, effervesces but slightly, and deposits a neutral salt of a very irregular crystallization. The only use to which this lime is applied by the inhabitants is to whitewash their houses. It is of two kinds, one perfectly white and easily reducible to an impalpable powder, found in the mountains of Calchagua and Maúle; the other, which is of a yellow hue, but becomes paler and discoloured with age, is brought from the province of Chillan.

The metallic earths or chalks, discovered in Chili, are the mountain green and blue, native ceruse, lapis caliminaris, brown, yellow, and red ochres; of the latter there are two varieties, one of a pale, and the other of a bright red like cinnebar; the last is called *Quenchu*, and is mentioned by commodore Anson as being found in great quantities in the island of Juan Fernandez.* Some give it the name of native minium from its appearance, and its weight differs very little from that of red lead; it is supposed to have been produced from the calci-

nation of mines of lead by subterraneous fires. The veins of both these ochres run deep into the ground, and their quality is found to improve in proportion to their depth.

Few places in Chili are in reality sandy, or so covered with sand as to be incapable of vegetation. But the rivers abound with it, owing to the constant friction of the pebbles with which their beds are lined, and on their shores all the various kinds of sand described by naturalists may be found. The black sand of Virginia (arena micacea nigra) first described by Woodward, is common on the sea shore and on the banks of several rivers; it is black and very heavy from the quantity of ferruginous particles it contains. In the same places is also found another kind, differing from the former only in colour, which is a beautiful Prussian blue; for this reason I have called it the black blue sand (arena cyanea). Near Talca, the capital of the province of Maúle, is a little hill which furnishes a species of cement sand, known by the name of Talca sand (arena talcensis). This sand is finer than that of Puzzoli in Italy, and appears to be a volcanic production, as its earthy and ferruginous parts are half calcined. The inhabitants employ it in their buildings for those walls which they intend to whiten, as of itself it forms a very strong cement, to which the lime adheres firmly.

Sect. VII. *Stones.*—In Chili, a country whose mineralogy is so imperfectly known, very few new species of stones have been discovered, in either of the four orders into which naturalists have divided them. In the short excursions which my occupations allowed me to make among the mountains, I have noticed, of the argillaceous kind, various sorts of schistus, slate, talc, asbestos, and mica. Of the latter the membranaceous mica of Chili, otherwise called Muscovy glass, is found there in its greatest perfection, both as respects its transparency and the size of its laminæ; of this substance the country people manufacture artificial flowers, and, like the Russians, make use of it for glazing their houses. The thin plates which are used for windows are by many preferred to glass, from their being pliable and less fragile, and possessing what appears a peculiar property, of freely admitting the light and a view of external objects to those within, while persons without are prevented from seeing any thing in the house. It is as white and transparent as the best glass, and is frequently found in plates of a foot long; and I am convinced, if a little care was used in digging it, they might be procured of double that size. There is a second kind, found in very large plates, which I have called *mica variegata*. It is spotted with yellow, red, and blue; but as it

cannot be applied to the uses of the first, it is of course held in much less estimation.

Those of the calcareous kind are limestones, marbles, calcareous spars, and gypsums. Of the limestones, there are those that are very compact and of all colours, the shining red, the coarse white, the blue, and the grey.

The plain marbles, or those of but one colour, hitherto discovered in Chili, are the white statuary marble, the black, the green, the yellow, and the grey. Two mountains, one in the Cordilleras of Copiapo, and the other in the marshes of Maúle, consist wholly of a marble striped with bands of various colours, which have a beautiful appearance. The variegated marbles are the ash-coloured with veins of white, yellow, and blue; the green speckled with black; and the yellow with irregular spots of green, black, and grey. This last is found at St. Fernando, the capital of Calchagua; it is in high estimation, is easily wrought, and becomes harder from exposure to the air. The Chilian marbles are generally of an excellent quality, and take a fine polish. Several who have examined the interior Andes, have informed me that those mountains abound with marbles of various kinds, and of almost all colours; but their observations were too superficial to afford me a correct description.

In the plains near the city of Coquimbo, at

the depth of three or four feet, is found a white testaceous marble, somewhat granulated. It is filled with shells of the snail kind, more or less entire, which give it the appearance of shell work. The quarry is several miles in extent, and generally about two feet in thickness, but varying according to the number of strata, which are from five to eight, frequently interrupted by very thin layers of sand. These strata increase in hardness in proportion to their depth; the upper consists wholly of a coarse brittle stone, which is only proper for lime; but the marble of the others is very compact, requires but little labour to dig, and after a short exposure to the air, obtains a degree of solidity and firmness sufficient to resist the injuries of the weather.

Spar, a substance common to all metallic mines, and which often serves as a guide to the miners to determine the character of the ore, abounds in Chili, where all the known species have been discovered, excepting the crystal of Iceland. Of these species the varieties are infinite, and many of them, if examined attentively, might be found to be real and distinct species. Coloured spar, known by the names of false emerald, topaz, and sapphire, is one of the species most frequently met with. But the most curious of all the Chilian spars is one of an hexagonal form, and perfectly transparent; it is found in the gold mine of Quillata, and is

crossed in various directions by very fine golden filaments, which give it a most beautiful appearance.

Quarries of the common or parallelopipedal gypsum, the rhomboidal, and the striated are numerous in Chili. But the inhabitants make little use of either, preferring a species of gypsum, of a beautiful white a little inclining to blue, which is very brittle and composed of small irregular particles; it is always found in the vicinity of volcanoes, in a semi-calcined state, from whence I have denominated it the volcanic gypsum (gypsum volcanicum.) The quarries from whence it is procured are of great extent; it is principally employed for plaistering walls, to which its slight tint of blue gives a very agreeable appearance; it may be used in its native state, but the masons generally prepare it by a slight calcination. The Andes abound with quarries of fine alabaster, and a species of pellucid selenite, which is used by the inhabitants of St. Jago instead of glass for the windows of their churches.

Of the sandstone there are various kinds, the whetstone, flint, quartz, and rock crystal. The first contains three varieties, the white, the grey, and the yellow: the mill or grindstone, and the freestone, which likewise belong to the same class, are very common in Chili. The mountains contain great quantities of quartz, both the

opake, the pellucid, and that of different colours, as well as common flint, and several species of agate. Of the plain jaspers there are the fine red, the green, the grey, the white, and the true lapis lazuli ;* and among the variegated, the grey spotted with black, the whitish interspersed with yellow and blue, and the yellow marked with blue, red, and grey spots. Besides the pieces of rock crystal found in all parts of the country, blocks of it are obtained from the Cordilleras of a size sufficient for columns of six or seven feet in height. They also contain great quantities of coloured crystals, or spurious precious stones, resembling in appearance rubies, jacinths, diamonds, &c. Not many years since, a real topaz of a very large size was found in the province of St. Jago, and a beautiful emerald at Coquimbo. From time to time the rivers wash down with their sands various kinds of precious stones, particularly rubies and sapphires,

* In the plains of Copiapo, are also great quantities of loadstone, and of lapis lazuli, which the inhabitants consider as of no value. These mines are at the distance of fourteen or fifteen leagues from Copiapo, and in the vicinity of a tract of country abounding in mines of lead.—*Frazier's Voyage*, vol. i.

The lapis lazuli, according to the opinions of the best informed mineralogists, belongs to the genus of zeolites.—Fr. Trans.

which, though small and of little value, fully prove that the mountains producing them contain those that are of great worth. But the indolence of the inhabitants, which induces them to neglect many other important branches of commerce, has hitherto prevented them from attending to this, notwithstanding it might become of the utmost importance.

A little hill at the north-east of Talca, consists almost entirely of amethysts. Some are found enclosed in a grey quartz, which serves them for a matrix, and others isolated among the sand. They are more perfect both in colour and hardness in proportion to their depth, and were those who search for them to dig deeper, they would, most probably, discover them in the highest state of perfection. A short time before I left Chili, I saw some that were of a beautiful violet, and would cut glass repeatedly without injuring their points. Among them were a few of as fine a water as the diamond, and perhaps they may serve as precursors to that most valuable gem. They are so abundant, that in some of the crevices of the rocks, those of a fine purple may be discovered at almost every step.

The province of Copiapo owes its name, according to the Indian tradition, to the great quantity of turquoises found in its mountains. Though these stones ought, with propriety, to be classed among the concretions, as they are only

the petrified teeth or bones of animals, coloured by metallic vapours, I have thought proper to mention them here, as they are placed by many among the precious stones. The turquoises of Copiapo are usually of a greenish blue, some, however, are found of a deep blue, which are very hard, and known by the name of the turquoises of the old rock.

Mixed stones, of those formed by the combination of several heterogeneous substances, are here, as elsewhere, the most numerous, and form a considerable portion of the Chilian mountains. Beside the common stones of this class, various kinds of porphyry and granite of the first quality are constantly met with; and the skirts of the mountains bordering the high road across the Andes to Cujo, consist wholly of red, green, black, and other coloured porphyries. Among these is one which deserves particular attention; it is yellow, spotted with red and blue, and from its being found in the neighbourhood of the river Chili, I have given it the name of *saxum Chilense*.

In the plains near the confluence of the Rio-claro, a large quarry of brown porphyry with black spots has been discovered. It is disposed in strata of two feet broad and four inches thick, a proportion which hitherto has been found invariable; and notwithstanding the layers are frequently broken by crevices or some foreign sub-

stance, pieces have been procured of more than eight feet in length. These pieces are so even and smooth, that they are used by the painters to grind their colours upon, without any preparation. It is not easy to account for the arrangement and regular formation of this stone; the earth in the environs is composed of sand, clay or marle, and between the layers only is a coarse sparry or quartzeous sand to be found.

In the plains, and upon most of the mountains, are to be seen a great number of flat circular stones, of five or six inches in diameter, with a hole through the middle. These stones which are either granite or porphyry, have doubtless received this form by artificial means, and I am induced to believe that they were the clubs or maces of the ancient Chilians, and that the holes were perforated to receive the handles.*

Sect. VIII. *Salts.*—That part of the Andes corresponding with the provinces of Copiapo and Coquimbo, contains several mountains of fossil salt, dispersed in strata or layers, crystallized in transparent cubes, frequently coloured

* *The nations of the South Sea Islands, discovered by Captain Cook, have among their weapons clubs of a similar form to what our author supposes these to have been.*—Fr. Trans.

Any shape would be better for the head of a mace than the flat circle. Is it not more likely that this was a missile weapon, similar to the *chuckra* of the Hindoos ?—*E. E.*

with yellow, blue, and red. The surface generally consists of an argillaceous earth. This salt is excellent, but it is used only by such as live in the vicinity; as those who are at a distance prefer the sea salt, which is obtained in great quantities, and of a fine quality upon the coast, particularly at Bucalemu, Boyeruca, and Vichuquen. In the middle districts, however, the salt from the springs of Pehuenches, which I have already mentioned in treating of mineral waters, is most generally used.

Sal-ammoniac, either incrusted or in a state of efflorescence, is very common in many parts of Chili. It is also found of various colours, in a fossil state, in the vicinity of volcanoes, of which it appears to be a production.

Much of the marly ground in the neighbourhood of the city of Coquimbo is covered with a crust of some inches of crystallized nitre, with a base of fixed alkali.*

In other parts of the same province this salt is found with a calcareous base; but we must not consider as nitre all the salts which the inhabitants represent as such, for the natron is likewise found there, or earthy alkaline salt, combined with sea salt, and sometimes with the volatile

* Nor is saltpetre less common there, which is frequently found in the valleys an inch thick upon the surface of the earth.—*Frazier's Voyage*, vol. i.

alkali, to which they improperly give the name of nitre.

Besides common alum, and that called the plumed,* which are found in many parts of Chili, a semi-crystallized aluminous stone has been discovered in the Andes. This stone, called by the inhabitants *polcura,* is brittle and of a pale white, of a very fine grain and a vitriolic taste; its external appearance is like that of white marble, but it contains no calcareous particles, nor is it in reality any thing but a clay saturated with vitriolic acid, analagous to the aluminous stone of Tolfa. It is useful in dying, and the quarries from whence it is procured comprehend a space of many leagues among the mountains, which also afford another stone in some measure resembling it, but coarser and of much less value. Its yellow hue, and the quantity of sulphur and pyrites it contains, distinguish this last from the real *polcura,* which is very pure, and not combined with any metallic substance.

The four principal kinds of vitriol, the green or iron, the blue or copper, the white with a zinc base, and the mixed, are found in a stalactite or crystallized state as well as that of efflorescence in the mines; and even isolated in different earths; the metallic substances which produce it being,

* *This name is given to a species of talc, consisting of filaments, otherwise called the asbestos stone.*—Dictionnaire de l'Academie.

under different modifications, dispersed throughout the country.

Sect. IX. *Bitumens.*—The Andes, heated by subterraneous fires, produce in many places white and red naphtha, petroleum, asphaltos, and mineral pitch of two kinds, the common, and another of a bluish black, which when burnt exhales an agreeable odour like amber. This bitumen, which I believe to be condensed naphtha, I have named bitumen andinum, and it is perhaps only a variety of the Persian mummy. It is not uncommon, and is discovered in large quantities in those places that produce it. Jet is very plentiful in the Araucanian provinces; and near the city of Conception, and in various other parts of Chili, pit-coal is found in great abundance.*

Considerable quantities of ambergris are thrown up by the sea upon the Araucanian coast and the islands of Chiloé. The Indians call it *mcyene* (the excrement† of whales) and pretend that when

* The mountains in the neighbourhood of the Puelches afford mines of sulphur and of salt; and in Talcaguano, Irequin, and even in the city of Conception, several good mines of coal have been discovered at the depth of one or two feet from the surface.—*Frazier's Voyage*, vol. i.

† The Brazilian Indians believed it to be the food of the whale, which had been vomited. These opinions tend strongly to confirm the received theory that it is the ill-digested food of this animal.—*E. E.*

it is first thrown up it is black, that it next becomes brown, and after a long exposure to the sun acquires a grey colour. Pieces of yellow amber are occasionally found upon the shores, which prove that Chili contains also this valuable production. In the province of Copiapo, one of the richest parts of the world in minerals, are two little mountains almost entirely composed of the most beautiful crystallized sulphur, so pure that it does not require refining.* And there is scarce a valley in the Andes, but what contains a reservoir of this mineral.

Sect. X. *Pyrites.*—The whole territory of Chili is sown with pyrites. They are of different qualities and shapes, and discovered at various depths, frequently in groupes, but more usually in veins varying in extent and thickness. They most generally accompany metals of some kind, and are found both in veins of ore, in chalk, clay, and common stone, but rarely in quartz or in rock crystal.

In the three divisions, under which they may be classed, the iron, the copper, and the arsenic,

* On the high ridge of the Cordilleras, forty leagues south-east from the harbour of Copiapo, are the best mines of sulphur. It is procured, from veins about two feet wide, in a state so pure as to require no refining.—*Frazier's Voyage*, vol. i.

they present themselves with such different modifications, that a particular enumeration and description of them would require a volume. The most remarkable species of those that I have seen, is the auriferous pyrites, generally denominated the Inca stone. M. Bomare, in his Dictionary of Natural History, observes, that this stone is very rare, and found only in the tombs of the ancient Peruvians. This may perhaps be the case in Peru, but it is otherwise in Chili, where it is found in great quantities upon the Campana, a high mountain in the province of Quillota, and is known by the same name. This pyrites is of a cubical figure, and contains a mixture of gold and copper mineralized with sulphur. It emits but a very few sparks with the steel, a circumstance which distinguishes it from all other species.

Sect. XI. *Semi-metals.*—All the known kinds of semi-metals are met with in Chili, and are found either in mines by themselves, or combined with metallic ores, and generally in a state of mineralization. But the working them is neglected or prohibited, and antimony is the only one sought for, as it is necessary for refining the precious metals. This mineral is discovered under various forms, as, the red antimony combined with arsenic and sulphur, the striated and the compact, all of which are found in mines of

gold, silver, iron, and lead. One mine alone has furnished crystallized antimony.

The digging of quicksilver is rigorously prohibited in consequence of its being a royal monopoly. It is found in a metallic form, or mineralized with sulphur, under that of cinnabar. The two richest mines are in the provinces of Coquimbo and Copiapo, from whence vast quantities might be obtained if it were permitted to work them, the greater part of which would probably be sold in the country itself, as much is required for the amalgamation of the precious metals. The mine of Coquimbo is in one of the midland mountains. The bed of matrix of the quicksilver is a species of brownish clay, or a very brittle black stone; in this the quicksilver is found in great abundance in its natural state, in horizontal veins, occasionally intersected by mineralized mercury or cinnabar. That of Quillota is situated in a very high mountain near Limache, and appears to be as rich as the former. The quicksilver is mineralized with sulphur: its matrix is a calcareous stone, which would serve very well, as an intermediate substance, to retain the sulphur, if the mercury were to be separated from it by a chemical process.

Sect. XII. *Metals.*—The Chilians set little value upon lead mines, although they possess those that are of an excellent quality. No

more of this metal is dug than what is wanted in the foundries for the melting of silver, or is employed for domestic purposes. Lead is not only found in all the silver mines, but, in cubes of various sizes with the galena or black lead, in mines of pure ore, or intermixed with spar of different colours. All the lead mines contain either gold or silver, but in too small a quantity to excite the attention of the miners. The mines of tin, although excellent, are equally neglected with those of lead. This ore is usually found in sandy mountains, not like other metals in continued veins, but under the appearance of black stones, very brittle and heavy, of an unequal size and irregular shape. In this state, the tin contains a small portion of iron, mineralized with a little arsenic. Crystals of tin, of various colours, are also common throughout Chili.

M. de Pauw, with a dash of his pen, has driven out of this country all its iron mines, since he boldly asserts that "Chili does not contain a single mine of iron." But Frazier, and other writers who have been in that country, declare the contrary.*

* "In order the more to depreciate America, Pauw asserts, that there are but few iron mines in that quarter of the world. And, what is still more singular, that the iron procured from them is of very inferior quality to that of the old continent, so much that it will not answer even for nails; and

So plentiful is this metal in the country, that, as I have already observed, the brooks and rivers deposit great quantities of sand, replete with particles of iron upon their shores, the sea also washes it up at times in great abundance.

The provinces of Coquimbo, Copiapo, Aconcagua, and Huilquilemu, are very rich in mines of iron; it is found under various appearances, as a black, a grey compact ore, or crystallized in bluish cubes. From the essays that have been made, the iron of these mines is of the very best quality; but the working of it is prohibited, in order to favour the trade of Spain, from whence all the iron used in the country is brought. But during the last war between England and Spain, when iron was at an exorbitant price, several quintals were secretly wrought, which proved to be of a superior quality. The Araucanian

that, in consequence, it is so dear as to be sold in Peru at the rate of a crown, and steel at a crown and a half for the pound weight."

The iron, however, so much decried by this author, who supposes it to be American, is what is imported from Europe. But supposing his assertion to be true, for what purpose has the Spanish government prohibited the working or selling any iron but that which is brought from Spain?

"In the vicinity of Copiapo, besides the mines of gold, there are many of iron, copper, tin, and lead, that are not worked." And in the year 1710, a number of mines of all kinds of metal, such as gold, silver, iron, lead, copper, and tin, were discovered at Lampague.—*Frazier's Voyage*, vol. i.

provinces likewise produce excellent iron, and I have been assured by an intelligent Biscayan smith, that it was no way inferior to the best in Spain. In the same country has likewise been discovered a species of that mineral substance called *refractarias*; and there is scarce a province that does not contain a mine of load-stone: Frazier speaks of a mountain in the Andes, called St. Agnes, which is entirely composed of this substance.

If the Chilians have neglected the working of mines in general, this cannot be said of those of gold, silver, and copper, to which great attention has been paid, from the conquest to the present time. The richest mines of the latter are found betwixt the 24th and 36th degrees of latitude; the ore obtained from them is of various qualities, some very fine and some but indifferent. Ulloa, in speaking of this copper generally, assigns to it the second place after that of Corinth, which is properly considered as an artificial metal.* Almost all the copper in Chili contains a greater or less proportion of gold. This was well known to the French, who, in the beginning of the present century, carried on a profitable commerce with that

* In the province of Coquimbo all kinds of metals are so common, that it would seem as if the earth was entirely composed of mineral. In that province are those mines of copper which supply the consumption of Chili and Peru, and although it is considered as the best of any hitherto known, it is dug very sparingly.—*American Gazetteer*; article CHILI.

country for copper, great quantities of which they exported, and extracted the gold from it. The proportions of these metals are very various, there are some copper ores which contain a tenth, and others a third part of gold; but in these cases both substances are found in a metallic state, without having been mineralized.

The copper ores, containing but little or no gold, are usually mineralized with arsenic or sulphur, sometimes with both, and mixed with iron and silver. They are found under the forms of vitreous and hepatic ore, of ultramarine stone, and of malachite and white copper ore. These several ores are rich in metal, but, from the expense of refining them, they are considered as of no value. The ores that are wrought are but two kinds, the grey or bell metal, and the malleable copper. The grey ore, or bell metal, is usually mineralized with arsenic and sulphur; it contains no gold or other metal, except a small portion of tin.* From this mixture and its grey colour, which it retains even after having been melted and refined, it may be considered as a species of native bronze; it has another characteristic of that factitious metal in its brittleness, although its specific gra-

* *If the author has given an accurate description of this metal, it is of a very singular species, and nothing similar to it has been discovered in the mines of Europe*.....Fr. Trans.

vity, is much greater than that of the metals composing it, when artificially combined. This brittleness renders it unfit for any thing but the casting of cannon, bells, &c.

Large quantities of this metal are sent to Spain for the use of foundries, whence M. Bomare has been led to observe, in his Dictionary of Natural History, that the copper of Coquimbo is of little value. The matrix of this ore is a grey sandy stone, easily broken ; and the relative proportions of the copper to the tin vary considerably.

The malleable copper is found in many of the other provinces as well as Coquimbo ; it possesses every quality requisite in that metal, and is the species from whence the Chilian copper has principally derived its high reputation. Its matrix is a soft brown and sometimes white stone ; the ore, which is mineralized with a small portion of sulphur, in its appearance and ductility resembles native copper, a simple roasting being sufficient to expel the sulphur, and render it malleable and fit for use. The miners, however, refine it in the usual manner, as they pretend that by this means it acquires a brighter colour. There is a remarkable affinity between this copper and gold ; those metals are not only always found combined, but veins of pure gold are frequently met with in the deepest copper mines. In this circumstance has originated the error of many

miners, who assert that copper, when it extends to a certain depth, becomes transmuted into gold. The veins do not always preserve the same course, and are frequently divided into small ramifications; and there is a still greater diversity in their *gangues* or matrices. A great number of mines have been opened, but those only are worked whose ore is so rich as to yield at least one half its weight in refined copper; those of a less product having been relinquished as too expensive; notwithstanding which, between the cities of Coquimbo and Copiapo, there are now in work more than a thousand mines, besides those in the province of Aconcagua.

The most celebrated copper mine in Chili was the old mine of Payen, but the working of it has been for many years relinquished, in consequence of the opposition of the Puelches, who inhabit that district.* On its first discover

* Mines of copper are very frequent in the vicinity of Coquimbo, at three leagues distance to the north-east of that city. It is also said, that mines of iron and of quicksilver are found there.—*Frazier's Voyage*, vol. i.

All the parts of the Cordilleras near St. Jago and Conception abound in copper mines, and particularly a place called *Payen*, some of which were formerly wrought, and pieces of pure copper of fifty and a hundred quintals weight obtained from them.—*American Gazetteer*; article CHILI.

Among the mountains of the Cordilleras a great number of mines of all kinds of metals and minerals are to be met with, particularly in two ridges, distant only twelve leagues from the

this mine furnished *pepitas*, or pieces of pure copper, from fifty to a hundred weight, which the writers of those times represent as of a beautiful colour resembling pinchbeck, and containing in general more than an equal portion of gold. This metal was so pure and easily separated from its matrix, that it required only a common fire to melt it.

A mine has lately been discovered at Curico, which is as rich as that of Payen. The ore consists of gold and copper in equal proportions, and the inhabitants have named it *natural avanturine*,* from its being filled with brilliant par-

Pampas (or great plains) of Paraguay, and a hundred from Conception; in one of which have been discovered mines of copper so productive that they have yielded pieces of pure ore of a hundred quintals weight. To one of these spots, which the Indians call Payen, that is copper, the discoverer, Don Juan Melendez, gave the name of St. Joseph. I saw at Conception a piece of ore of forty quintals weight, from which, when smelted, were cast six field pieces of six pounds caliber. And nothing is more common than to meet with stones composed partly of pure and partly of impure copper, which has given rise to the observation, that the soil of this country is *creative*; that is, that copper is constantly produced or created in it. The same mountain contains mines of lapis lazuli, and the other which is near it, called by the Spaniards Cerro de Santa Inis, is particularly remarkable for great quantities of loadstone, of which it appears to be entirely composed.—*Frazier's Voyage*, vol. i.

* A precious stone of a yellowish colour, full of small specks of gold.

ticles that give it a beautiful appearance. This metal is used by the goldsmiths for rings, bracelets, and other ornaments of jewelry.

In the province of Huilquilemu are hills that furnish a copper ore combined with zinc, or a real native brass. It is found in pieces of various sizes, and the matrix is a brittle earthy stone of a yellow colour, or a dull green. This substance, which has hitherto been obtained only by artificial means, probably owes its formation to subterraneous fires, which sublimating the zinc, and combining it with the copper, has produced this extraordinary natural mixture. It is of a fine yellow colour, and as malleable as the best artificial brass, and is called Laxa copper, from the river of that name in the vicinity of the mine.

The method of melting the ore is very simple: After separating it from the earth and superfluous matrix, it is broken into small pieces with wooden pestles. These pieces are placed between layers of wood, which are set on fire, and the heat kept up with a large bellows moved by water. The furnace is constructed of an adhesive clay; but the bottom, which is slightly inclined towards the centre, is formed of a cement of plaister and calcined bones. The vault contains a sufficient number of outlets for the smoke, and at the top is an aperture that may be closed or opened at pleasure, which serves for the introduction of ore and fuel.

At the bottom of the furnace is a hole for the passage of the liquefied metal, which is conveyed into a receptacle, and from thence taken and refined in the European manner.

I do not know what quantity of copper is annually obtained from the mines, but from the exportation it must be very considerable. Five or six ships sail every year for Spain, each of which usually carries twenty thousand quintals or upwards. Much is also sent to Buenos-Ayres by land; and the Peruvians, who have an extensive commerce with the coast, export at least thirty thousand quintals yearly, which is principally employed in their sugar works. Besides which, the quantity made use of in the cannon foundries, and for domestic purposes, is by no means inconsiderable.

The mines of copper are not confined to any particular district, but scattered throughout the country; those of silver, on the contrary, are found only in the highest and coldest parts of the Andes. This situation, so unfavourable for working them, and the vast expense of refining, have caused a great number of mines, though rich in ore, to be abandoned, and there are but three or four that are at present worked. But it may be presumed, when the population of this country becomes increased and its industry excited, that these mines, now neglected, will become an

object of attention, and that the enterprise of a future generation will conquer those obstructions which impede the labours of the present.

All the provinces bordering upon the Andes produce some silver mines, but the richest are in those of St. Jago, Aconcagua, Coquimbo, and Copiapo. In these it is found not only in a metallic form, but under the appearance of vitreous ore, hornbend, and red, grey and white ore, wherein the silver is mineralized with sulphur and arsenic, and it is occasionally found combined with other metals. In the year 1767, a piece of silver ore was found in the neighbourhood of Copiapo; it was of a green colour, and, on being assayed, was found to contain three-fourths of pure silver. It was mineralized with a small quantity of sulphur, and much search has since been ineffectually made by the inhabitants to discover the vein from which it was detached.

The ore held in the highest estimation by the miners is the black, so called from its matrix being of a dark colour. Those of them who are experienced are scarcely ever deceived in this ore, and whenever they strike upon a new vein, can nearly determine by the eye the quantity of silver which it will yield. This ore presents three very distinct varieties, though differing but little in appearance. The first, called *negrillo*,

resembles the scoria of iron, and affords no apparent indication of silver. The second, the *rosiclaro*, which is distinct from the red silver ore, yields a red powder when filed; it is very rich, although its external appearance is not promising. The third, the *piombo ronco*, is the richest of all; as it is mineralized with a very small quantity of sulphur, it is much more easily separated than the others, which require a more laborious and complicated operation.

These three varieties of ore are obtained from the mine of Uspallata, the largest and richest of any of the silver mines in Chili. It is situated upon the eastern mountains of that portion of the Andes which forms a part of the province of Aconcagua. On the top of these mountains is a large plain called Uspallata of more than seventeen leagues in length and three in breadth, it is watered by a pleasant river and covered with delightful groves, the air is healthy and temperate, and the soil fertile. This plain serves as a base to another more elevated, called *Paramillo*, upon which the Andes of the first rank rise to such a height as to be seen distinctly at St. Louis de la Punta, a distance of one hundred and twenty leagues. The ridge of these immense mountains is a blackish clay stone, containing a great number of round stones similar to those of rivers. This phenomenon appears to be unexplainable

in any other way but on the principle of a general deluge; though some authors have, ridiculously enough, accounted for it, by supposing that the ancient Indians amused themselves in throwing these stones upon this mass, while it was yet soft and in a state of clay. But besides the irrationality of such a conjecture, the Abbé Morales of Cujo, an intelligent naturalist, who carefully examined these mountains, affirms that the interior of this mass is no less filled with these stones than the exterior, which of itself affords a sufficient proof to the contrary.

The mine of Uspallata extends along the base of the eastern mountains of the plain of the same name, from the thirty-third degree of latitude, in a direct northerly course; but the termination of it is unknown, for I have been assured, by persons who have followed it for thirty leagues, that it continues to be equally abundant at that distance, and there are those who assert that it is a ramification of the celebrated mine of Potosi.

The principal vein is nine feet in breadth, but it branches out upon both sides into several that are smaller, which extend to the neighbouring mountains, and are said to exceed thirty miles in length. The matrix of the great vein is a various-coloured earth, which separates it into five parallel divisions or layers, of different thicknesses. The middle layer is but two inches thick; the ore, which is called by the miners the *guida*,

as black, but so filled with metallic particles as to have a whitish appearance; the two next strata are brown, and are called *pinterias*, the two exterior ones are of a dark grey, and known by the name of *brozas*. Although the general direction of this vein is horizontal, it sometimes runs perpendicular, and is found to increase in richness in proportion to its depth. From assays, which have been made at Lima on the ore of Uspallata, it appears that the *guida* yields more than two hundred marks of silver the *caxon*;* the *pintarias*, mixed with the *guida*, fifty; and the *brozas* fourteen; a produce not inferior to that of the mine of Potosi. The mine of Uspallata was discovered in the year 1638, but although on its first discovery it furnished the strongest indications of its wealth, from want of labourers, or some other cause, it was neglected until 1763, but since that period has been constantly wrought with immense profit.

Before the arrival of the Europeans, the Indians employed a very simple method to separate the silver from the ore, especially when the metal was in a metallic form, and not mineralized

* A term made use of by the American metallurgists to express the quantity of ore which a single miner can dig in a day, usually calculated at fifty quintals; but, as this quantity contains more or less of the matrix, it is imposible to ascertain the amount of pure ore contained in each *caxon*.

or combined with other substances. This method consisted in merely exposing the ore to a degree of heat capable of melting the metal which it contained. When the ore was united with other substances, or mineralized, and of course more difficult to be melted, they made use of a kind of open furnace, constructed upon elevated ground, in order that the fire should be kept up by a constant current of air. This appears to have been adopted with a view to save labour, as they were not unacquainted with the use of the bellows, which was known to them under the name of *pimahue;* and even at present this mode is preferred by the poorer class, who practice it, and no small part of the silver, employed as a circulating medium in Chili, is obtained from these clandestine foundries.

The process generally pursued, particularly by the wealthy proprietors, is that of amalgamation.* In this case they begin with reducing

* Almost all the precipitous and broken grounds of Chili contain gold in greater or less quantities; the surface of the earth in which it is found is generally of a reddish colour and soft to the touch.

These *lavaderos*, or places producing earth which yields gold by agitating it in water, are very common in Chili, but the indolence of the Spaniards and the want of labourers suffer immense treasures to remain in the earth which might easily be obtained; but, not satisfied with small gains, they work those mines only which yield a great profit; of course,

the ore to powder by grinding it in a mill. This powder is then passed through a wire sieve and spread upon the hides of cattle, where it is mixed with sea salt, quicksilver, and rotten dung. After

whenever any one of this character is discovered, numbers flock to it from all quarters, as was the case of Copiapo and Lampagua, which by this means became peopled so rapidly, from the great concourse of labourers, that in the space of two years six mills were established at the latter place. The city of Conception is situated in a country abounding not only with all the necessaries of life, but with immense riches, particularly a place called the King's Camp, about twelve leagues to the east, from whence is obtained by the *lavadero* pieces of pure gold, called in the country *pepitas*, of from eight to ten marks* in weight. It has likewise been discovered in the vicinity of Angol; and if the inhabitants of the country were industrious, many other spots would be explored where it is believed there are very good *lavaderos*. Nine or ten leagues to the east of Coquimbo are the *lavaderos* of Andacoll, which produce gold of 23 carats fine, and are worked constantly with great profit when there is no scarcity of water. This has given rise to a saying of the inhabitants that the ground is *creative*, that is, that gold is continually formed in it; founded in the circumstance of their finding that metal in as great quantities as at first, although it is sixty or eighty years since these *lavaderos* have been worked. Besides the *lavaderos*, which are in all the valleys, so numerous are the mines of gold and some of silver that are met with in the mountains, that they would furnish employment for more than forty thousand men.—*Frazier's Voyage.*

Chili abounds in mines of all kinds, more especially in

* *The Spanish mark is eight ounces.*

wetting this mixture from time to time, and beating and treading it well for the space of eight days, in order to incorporate the silver and the mercury, it is put into a stone trough with water sufficient to dilute it. In this situation, the silver amalgamated with the mercury, from its weight sinks to the bottom, while the lighter heterogeneous particles are drawn off with the water through a hole in the trough into a vessel placed to receive it. This amalgam, after having been repeatedly washed to cleanse it from all foreign substances, is put into a linen bag, and the mercury, which

those of gold and copper, which are very common. Coquimbo, Copiapo, and Guasco have gold mines, the ore of which is called by way of distinction, *oro capote*, as being the most valuable of any that has hitherto been discovered.—*American Gazetteer*; article CHILI.

These valleys contain, besides mines of silver, those of lead, copper, and quicksilver, and a very great number of gold. Of this last there is so much found in the sands of the rivulets, that a certain author has said that Chili is a composition of this precious metal. The quantity obtained by Pedro de Valdivia, who entered Chili after Almagro, was immense. That general opened mines of gold which were so rich that each Indian furnished from thirty to forty ducats daily, as, when only twelve or fifteen where employed, he obtained three or four hundred ducats a day. This concurs with what Garcilasso says in his history of Peru, that a part of Chili fell to the lot of Valdivia, who received from his vassals an annual tribute of more than one hundred thousand pieces of gold.—Sanson's (of Abbeville) *Geography*; article CHILI.

has not become incorporated with the silver, expressed from it. In this state of paste the amalgam receives any shape, but is usually formed with moulds into small cylindrical tubes. The last process is that of separating the mercury from the silver; this is done, by means of evaporation, in a receiver which is filled with water, and closely fitted with a head. The small quantity of lead or other metal that may remain after this process can only be detached by melting it.

Gold, of all the metals, is that which is most abundant in Chili, and it may be said that there is not a mountain or hill but contains it in a greater or less degree; it is found also in the sands of the plains, but more especially in those washed down by the brooks and rivers.* Several French and English authors affirm that the gold of Chili is the purest and most valuable of any; and it is true that its general standard is from twenty-two to twenty-three and a half carats. In the southern provinces, between the

* A person, on opening a water-course to an estate in the plain of Huilquilemu, discovered, with much surprise, a vein of gold dust, which produced more than fifty-thousand dollars without the least labour. The same good fortune occurred to another in ploughing a piece of land for grain. These instances are not unusual; and naturalists have given the name of *montas* to these kind of casual mines, which are always of small extent.

river Bio-bio and the Archipelago of Chiloé, several very rich mines of gold were formerly discovered, which yielded immense sums; but since the expulsion of the Spaniards from those provinces by the Araucanians, these mines have been in the possession of that warlike people, who have prohibited the opening them anew by any one under pain of death.

The most important mines that are at present wrought are those of Copiapo, Guase, Coquimbo, Petorca, Ligua, Tiltil, Putaendo, Caen, Alhue, Chibato, and Huilli-patagua. All these, excepting the three last, which are of recent discovery, have been wrought ever since the conquest, and have constantly yielded a great product. But this is by no means the case with all the mines that are discovered: in many the miners are allured at first with appearances of great riches, but soon find the ore entirely fail, or in so small quantities as not to repay them for their labour. The metallurgists of Chili call this kind of wandering mine *bolson*; the same name is also applied to the ramifications, which in general are circular, and to the richest veins where the ore is found lodged in heaps and cavities. Another obstruction to working the mines are the inundations to which they are subject from subterraneous springs. These are frequent, and, when they occur, compel the miners to abandon the mine, who

seldom attempt to free it by drawing off or diverting the water. Some years since an accident of this kind occurred to the celebrated mine of Peldehus, in the neighbourhood of St. Jago. That mine, which produced daily upwards of fifteen hundred pounds weight of gold, was suddenly inundated, and the workmen were compelled to abandon it, after having in vain made every exertion to free it from the water.

The matrix of the gold is very variable, and it may be said that there is no kind of stone or earth but what serves it for that purpose. It is to be seen every where, either in small grains or brilliant spangles, under singular forms, or in irregular masses that may be cut by the chissel. The most usual matrix is a very brittle red clay stone. The *salbanda,* or the exterior covering of the veins, called by miners *caxas,* is as variable as the matrix; it is sometimes of spar or quartz, at others it consists chiefly of flint, marble, or hornbend. The principal veins are frequently ramified into a number of smaller ones that are generally very rich. They sometimes descend almost vertically into the earth, and in those instances require great labour and expense to be pursued; at others they take a circular direction a few feet under ground, and meet, particularly at the foot of mountains. The usual course of the veins, though subject to some variations, is from south to north.

The mines are worked both with the pickaxe and by explosion. The ore is reduced to powder in a mill of a very simple construction, called *trapiche*, of which two stones, the lower placed horizontally, and the upper vertically, form the mechanism. The horizontal is about six feet in diameter, and has near its circumference a groove of eighteen inches deep, in which the ore is placed; through the centre passes a perpendicular cylinder connected with a cog-wheel turned by water. The vertical stone is about four feet in diameter, and ten or fifteen inches thick, and is furnished with a horizontal axis, which permits it to turn freely within the groove. When the ore is sufficiently pulverized, a proportionate quantity of quicksilver is added to it, which is immediately amalgamated with the gold; to moisten the mass, and incorporate it more fully, a small stream of water is then directed above it, which also serves to carry off the amalgam into reservoirs placed beneath the stone. The gold combined with the mercury falls to the bottom of these reservoirs in the form of whitish globules; the mercury is next evaporated by heat, and the gold appears in its true colour, and in all its brilliancy. In each of these mills upwards of two thousand weight of ore is daily ground and amalgamated.

As the digging of the stone ore obtained from

the mines is very expensive, from the number of workmen and the materials required, it is pursued only by the rich; but it furnishes a much greater profit than the *lavadero*, or the ore procured by the washing of auriferous sands, which is practised only by the poorer class, and those who cannot afford the necessary expenses of mining. The washing is performed in the following manner: the earth or sand containing particles of gold is put into a vessel of wood or horn, called *poruna*, which is placed in a running stream, and constantly shaken; by this means the sand which contains no metallic particles, being lighter, is thrown out over the top, and the more weighty, or the gold, remains at the bottom. This operation is necessary to be repeated several times in order to carry off all the ferruginous earth which is always united with gold. But as many of the smaller metallic particles must necessarily be washed away with the earth by this process, a mode, in my opinion, much more economical, is that employed in some places of washing the sand upon inclined planks covered with sheepskin. Defective as the process of washing is, the profit that accrues from it is frequently almost incredible, as it is not unusual to find among the sand large pieces of gold, called *pepitas*, which sometimes exceed a pound in weight; but it is more commonly found in a

pulverized state, and in the form of little round or lenticular grains. This gold is sold in the cities in little purses, made of the scrotums of sheep, as in the time of Pliny, and is generally more esteemed than that of the mines, as it is of a better colour and a finer standard.

The quantity of gold annually dug in Chili is difficult to be estimated. That called *oro-quintado,* which pays the fifth to the royal treasury, does not amount to less than four millions of dollars, of which there is coined at the mint of St. Jago, a million and a half; the residue is exported in bullion, or used in the country for plate and jewelry. The amount smuggled without paying the duty cannot be calculated, but it certainly is very considerable. I have made much search, but without success, to discover the platina, or white gold, found in Peru. What bears the name of white gold in Chili is a mixture of gold and silver, in which the latter predominates. But since I left that country a new immalleable metal, of a kind unknown to the miners, has been discovered in the gold mine of Capati, on the mountains of Copiapo, which I imagine can be no other than platina.

Many obstacles present themselves to impede the working of the mines, both in the danger to which the miners are exposed from the mephitic vapours, called mountain fires, and in the vast expense attending the digging them. The great

number of tools, the timber required for propping the arches, which is very scarce and expensive in the country, the numerous workmen who must be paid and subsisted, together with the uncertainty of the product, are reasons which operate powerfully to discourage those who are inclined to engage in mining; of course, the number of those who pursue this business is very small in comparison to that of the mines.

When any persons are desirous of opening a mine, application is made to the government, which readily grants its permission, and appoints an inspector, under whose authority and direction they begin by dividing the mine into three equal parts, or *estacas*, each two hundred and forty-six feet long and one hundred and twenty-three broad. The first portion belongs to the king, in whose name it is sold, the second to the owner of the land, and the third to the discoverer of the mine. As the opening of a mine is very injurious to the cultivation of the land in which it is situated, the proprietors of the soil endeavour to prevent as much as possible the discovery of veins in their grounds. The number of persons who flock from all quarters to a newly opened mine, that promises to be profitable, is almost incredible. Some come thither to work, others to sell their provisions, which at such times are in great de-

mand; and in this manner a kind of fair is gradually established, which leads to the erection of houses, and finally to the formation of a permanent town or village. A magistrate, with the title of the Alcayde of the mine, is then appointed by the government to regulate and superintend it, and as this office is almost always very lucrative, the governor of the province generally assumes it, and appoints a deputy to manage it for his account.

The miners of Chili are in general well acquainted with metallurgy. They are expert in mining and in the art of assaying and refining metals; but their knowledge is wholly practical, and they are entirely ignorant of the theory or the real principles of the art. They are divided into three classess, the first those who labour in the mine, the second the founders and refiners, the third the porters, or those who carry off the mineral. In general they are a bold, enterprising, and prodigal class of men. Familiarized to the sight of the precious metals, they learn to disregard them, and attach but little value to money. They are extravagant in their expenses, and passionately addicted to gaming, in which they pass almost all their leisure moments; and instances are not unfrequent of a miner losing one or two thousand crowns of a night. Losses of this nature are considered by them as trifles, and on such oc-

casions they gaily console themselves with a professional proverb, that, "the mountains never keep accounts." Nothing is more abhorrent to them than frugality, and whenever they find one of their companions who has amassed a sum of money by his economy, they leave no means untried to strip him of it, observing, that avarice is a vice peculiarly degrading to the character of a miner; and so addicted are they to ebriety, that those who on first joining them are remarkable for their abstemiousness, are soon led, from the influence of example, to participate in the general intemperance. From these causes none of them acquire property, and they generally die in the greatest poverty and distress, while the profits of their labour are wholly absorbed by those who supply them with provisions and liquor.

Sect. XIII. *Concretions.*—The last class of the mineral kingdom, the concretions, offers nothing very remarkable in Chili. Pumice stone is so common in the interior of the Andes, that it forms the substance of several mountains. A species of it, of a light grey, is in much estimation with the inhabitants, who use it for filtering stones. Petrified wood has been discovered in many places. I have seen pieces of hewn timber, completely petrified, dug out of a little hill near Valparaiso, some of which

were eight feet long, and bore the visible marks of the European axe, a proof that this wood must have become petrified since the arrival of the Spaniards.* Of all kinds of wood

* That the marks in this wood were produced by an axe, or some tool of a similar kind, I am not disposed to question; but that it must have been an European axe, will fairly admit of doubt. The Mexicans, on the arrival of the Spaniards, made use of axes or hatchets of copper, and, as we are assured by some respectable authors, possessed the art of tempering that metal for tools in a manner entirely unknown to the Europeans; and that this secret was known to the ancient Chilians is by no means improbable, considering their contiguity and intercourse with the Peruvians, a people whose progress in the arts was not inferior to that of the Mexicans. As the period when this timber was cut is however wholly conjectural, it may perhaps be referred to an earlier date than any authenticated or even traditionary accounts of the country; to an era when the use of iron was very possibly known, perhaps anterior to the deluge, when the face of the globe exhibited far different aspects and relations than at present. That this hypothesis is not wholly destitute of verisimilitude, the following may serve to show: One of the numbers of the Richmond Enquirer, for the present year, 1807, in giving an account of the antiquities of the interior of America, observes, that, "a copper mine was opened some years since further down the Mississippi (below the falls of St. Anthony) when, to the great surprise of the labourers, a large collection of mining tools were found several fathoms below the surface;" and the writer of this note has been informed, from respectable authority, that within a short time since, in the state of Kentucky, some labourers, in digging a well, discovered, at the depth of one hundred feet from the surface, the stump of a

the Chilian willow is perhaps the most susceptible of petrifaction, and pieces of it are every where to be met with that have undergone this change; to effect which, it requires to be buried but for a short time in a moist and sandy soil. I have also found pieces of the *Peruvian taper* with the thorns adhering to them completely petrified, though instances of this are less frequent, as the moist and spongy texture of that tree renders it less liable to petrifaction.*

large tree, with an axe adhering to it, apparently of iron, as on attempting to disengage it, it fell into pieces, which resembled the rusty scales of that metal.—*Am. Trans.*

* Coal is not mentioned among the mineral productions of Chili: Herrera, however, says there is a coal mine upon the beach, near the city of Conception; a black stone, he calls it, which burns like charcoal.—*E. E.*

Dec. 8. *L.* 6. *C.* 11.

CHAP. III.

Herbs, Shrubs, and Trees.

WHENEVER mineralogists undertake to characterize the external appearance of a mineral country, they describe it as particularly recognizable by the weakness of its vegetation and the faded colour of the plants, occasioned by the mineral vapours. This observation is in general too bold, and frequently contrary to experience. M. Macquer * observes very properly, that there are some countries which are rich in mines, whose vegetation is not injured thereby. This is precisely the situation of Chili, a country, as we have seen, rich in mineral productions of every kind, and enjoying at the same time a vigorous and profuse vegetation. The plains, the valleys, and the mountains, are covered with beautiful trees, many of which scarcely ever lose their verdure, and each season produces vegetables suited to the climate in the greatest perfection. Feuillé has given an account of those plants only which grow upon the

* *Dictionary of Chemistry*; article MINES.

sea shore, or in marshy places in its vicinity. The interior part of the country has never been explored by an able botanist, and I am convinced that a great number of unknown plants might be discovered there.

Had I been desirous of enlarging the limits of this work, I might have given a very copious enumeration of the plants of Chili; but I prefer confining myself to those only which are most important and useful. As these may be reduced to a small number, I have divided them into herbs, grasses,* climbing plants, shrubs, and trees. I am aware that this division is not scientific, but it is convenient, and better suited to the plan I have pursued in my description of vegetables.

Sect. I. *Herbs.*—Many of the plants which are found in the country, such as the mallows, trefoil, plaintain, endive, mint, nettles, &c. are common both to Chili and to Europe. Others that are carefully cultivated in the European gardens grow naturally there, such as lupins, love apples, Spanish pimento, celery, cresses, mustard, fennel, &c.† Of the tropical plants,

* I have rendered grasses what the author has called in Italian canne (*reeds*).—Fr. Trans.

† All our plants are cultivated there without difficulty, and produce abundantly, and there are some that grow naturally

several succeed very well in the northern provinces, among which are the sugar-cane, the pine-apple, the cotton, the banana, the sweet potatoe, jalap, mechoacan, and others of less importance. Besides these, Chili produces a great number of plants that appear to be peculiar to it. There are some that are common to all the provinces, others are confined to certain districts. In my different herborizations while in Chili, I collected about three thousand plants, the greater part of which are non-descript, and not to be found in any botanical work. Among these were a number whose flowers are remarkable for their beauty and fragrance, and which, in their season, give the fields the appearance of so many parterres; but the inhabitants in general pay but little attention

in the fields, as the turnip, succory, endive, &c. Nor are the aromatic herbs less common, as balm, mug-wort, camomile, and a kind of mouse-ear, which has the smell of a hyacinth; the alkengi, or winter-cherry, whose fruit is more odoriferous than that of France; a species of sage, called by the Indians *palghi*, that grows like a shrub, with a leaf resembling rosemary, and an odour like Hungary water. Roses grow naturally upon the hills; the most common kind are entirely destitute of thorns, or have but a very few. In the fields is found a flower similar to the kind of lily called in Britany *guerneziaises*, the Indian name of which is *liuto*; it consists of six petals, two of which are in the form of a plume. The root, when dried in an oven, furnishes a very white meal, which is excellent for pastry.—*Frazier's Voyage*, vol. i.

to them, and prefer decorating their gardens with exotic * flowers received from Europe, to cultivating their own.

The domestic animals live during the whole year in the open fields, and from feeding on the aromatic plants, so abundant in Chili, their flesh acquires a flavour superior to what it has in any other country. The Chilians have no occasion to provide hay for their cattle, as the herbage never fails, and there is a constant succession of the different plants which serve them for food. In the cities the horses are fed with barley and a species of clover. Trefoil, called by the Indians *gualputhe*, is one of the most common plants of the country; of this there are not less than twelve different kinds to be found in the meadows, which contain much lucerne, and a species of Venus's comb, commonly called *loiqui lahuen*, or *alfilerillo*, of which the cattle are peculiarly fond. This plant, which I have named *scandix chilensis*, is distinguished from the European species by its aromatic odour, by its stem, which is not striated, and by its leaves; these are larger,

* The rose-bush was introduced into Peru from Spain: it shot up so luxuriantly that it did not blossom. By some accident a rosier was burnt, and the young shoots from the root flowered. This taught them to cut the bushes down, and then they succeeded.—*E. E.*

Herrera 5. 4. 8.

and although winged like the Venus's comb of Europe, have some of their lesser leaves entire and fleshy. This plant is reputed to be vulnerary, and its Chilian name, signifying the herb of wounds, is expressive of this quality.

The soil is so fertile that the herbage grows to such a height in many pastures as completely to conceal the sheep, especially in the valleys of the Andes, where the vegetation is always the most vigorous. But amidst this luxuriant growth there are two or three species of plants injurious to cattle, which are much dreaded, especially a kind known in the country by the name of *yerba loca*, or herb of madness, from its rendering those animals who eat of it mad, particularly horses.

This plant, which forms a new genus, I have called *hippomanica*. Its stalks are of an angular shape, a foot and a half in height; the leaves are opposite, lanceolated, entire, and fleshy, of a clear grey, about an inch in length, and attached to the branches without a foot-stalk; the flower is formed like a rose, and grows at the top of the branches; it consists of five oval petals, of a yellow colour, supported by a calyx divided into five parts; when ripe, the pystil becomes changed into a capsula, separated into four cells, which contain black kidney-shaped seeds. The juice of this plant is viscous, of a yellowish colour, and sweetish

taste; the husbandmen take great pains to destroy it, notwithstanding which, it constantly springs up again, and if a horse eats of it, he is sure to die, unless immediate measures are taken to make him sweat profusely by violent exercise.

Besides those which have been brought from Europe, Chili produces a great number of valuable plants, both alimentary, medicinal, and such as are useful in the arts. Many of these, particularly the alimentary kind, were well known and cultivated before the arrival of the Spaniards.

Sect. II. *Alimentary Herbs or Plants.*---The maize (zea mais) or Turkey wheat, called by the Chilians *gua,* was well known in America when Columbus first arrived there. This fact is confirmed by all the writers of that period, and it is very certain that it was the only species of corn at that time made use of by the natives. The improper application of the name of the Indies to America has probably led M. Bomare to observe, that the maize is indigenous to Asia, from whence it was carried into Europe, and from thence to America. There are likewise some authors, as C. Durante, in his herbal, who improperly denominate it Turkey wheat, considering it as originally from Turkey.

Maize grows extremely well in Chili,* and

* In the old continent wheat is the most common grain, but in the new world maize has always been, and still is, the

the inhabitants cultivate eight or nine varieties of it, several of which are very productive. But that which is in the highest repute with them is called *uminta*; from this they prepare a dish by bruising the corn while it is green between two stones into the form of paste, to which is added sufficient salt or butter and sugar to season it; it is then divided into small portions or cakes, which are enclosed separately within the inner skin or husk of the corn and boiled.

When the maize is ripe the Indians prepare it for winter in two different modes, either by slightly roasting it, which they call *chuchoca*, or by drying it in the sun; from the former they make a kind of soup, by boiling it in water, and from the latter a beer of a very pleasant taste. They sometimes reduce it to meal, but before grinding, roast and crack it by means of heated sand. For this purpose they prefer a kind of maize called *curagua*, the grains of which are smaller than the others, and furnish a meal that is more light, whiter and in greater quantity. From this meal, mixed with sugar and water, either hot or cold, they make two different beverages, called *ulpo* and *cherchan*.

A species of rye called *magu*, and of barley

most general; it is produced in all parts of the West-Indies, in Peru, in New Spain, in Guatimala, in Chili, and throughout Terra Firma.—*Acosta's Natural History*, book iv.

called *tuca*, were cultivated by the Araucanians before the arrival of the Spaniards; but since the introduction of the European wheat, the cultivation of these has been entirely neglected, and I have not been able even to procure a specimen, for the purpose of describing them. All that is known at present is that the Araucanians made a bread from them called *covque*, which name they give to that made from maize or European grain.

The *quinua* is a species of chenopodium from three to four feet in height; it has large rhomboidal sinuated leaves of a deep green, and the flowers are disposed upon long spikes; the grain is black and spirally twisted, which gives it, of course, a lenticular appearance. There is a variety of this plant called *dahue* by the Indians, which has greyish leaves, and produces a white grain. The grain of the *quinua* serves for making a very pleasant stomachic beverage; that of the *dahue*, on being boiled, lengthens out in the form of worms, and is excellent in soup. The leaves are also eaten, and are tender and of an agreeable taste.

The *degul* is a species of bean (phaseolus vulgaris). Before this country was conquered by the Spaniards, thirteen or fourteen kinds of the bean, varying but little from the common European bean, were cultivated by the natives. One of these has a straight stalk, the other thirteen

are climbers; of these, two are very remarkable, the phaseolis pallar, the bean of which is half an inch long, and the phaseolus asellus, which is spherical and pulpy.

Chili is considered by M. Bomare as the native soil of that valuable esculent the potatoe (solanum tuberosum), an indigenous American root, likewise known by the names of *papa* and *pogny*. It is, indeed, found in all the fields of that country; but those plants that grow wild, called by the Indians *maglia*, produce only very small roots of a bitterish taste. It is distinguished by two different species, and more than thirty varieties, several of which are carefully cultivated. The first is the common kind; the second, called *solanum cari*, bears white flowers with a large nectary in the middle like the narcissus; its root is cylindrical and very sweet. The usual mode of cooking it is by roasting it under the ashes.

The oca (oxalis tuberosa) appears to be of a different kind from the oca of Peru; in its form and fructification it resembles the yellow wood sorrel; its leaves are disposed by threes, and are of an acid taste, and the flowers are oval; its root extends itself into five or six tuberosities of three or four inches in length, covered with a thin smooth skin. They are eaten cooked, and have a pleasant subacid taste. This plant is also, like the potatoe, multiplied by means of its

bulbs; there are several species of it, one of which, called by the Chilians *red culle*, is held in much estimation for dying, and is considered as a specific in inflammatory fevers. Among them is likewise the *barilla*, or the alleluia virgosa of Coquimbo: This last produces but a few radical trilocated leaves; its stalks, which are numerous, are very tender, and of an acid taste; they are five feet in length, of the size of a man's finger, and covered with yellow flowers suspended in vertical bells.

Of the gourd, two principal species are known in Chili, the white flowered, and the yellow flowered, or the Indian gourd. Of the first kind, called by the Indians *quada*, there are twenty-six varieties, several of which produce fruit that is sweet and edible, but that of the others is bitter. Of the bitter kinds the most distinguished is the cider gourd (cucurbita ciceraria*) so called from the Indians making use of it, after extracting the seeds and perfuming it,

* The calabashes of the Indians are another wonderful production for their size and the luxuriance of their growth; especially those called *zapallos*, the pulp of which, particularly in Quaresma, are eaten boiled or fried. There is a great variety of this species of the calabash; some of them are so large that when dried, and the shell divided in the middle and cleansed, they are used as covered baskets to put provisions in; others that are smaller are employed as vessels to drink from, or handsomely wrought for various purposes.—*Acosta's Natural History*, book iv.

to ferment their cider. It is naturally of a round form, and frequently grows to a large size. It is also used by the natives instead of baskets, and in such cases they give it whatever shape they think proper. The yellow flowered or Indian gourd, called *penca,* is of two kinds, the common and the mamillary; this last in its leaves and flowers resembles the first, but the figure of the fruit is spheroidal, with a large nipple at the end; the pulp is sweet, and its taste is very similar to a kind of potatoe known by the name of camote.

The *quelghen,* or the strawberry of Chili, differs from the European in its leaves, which are rough and succulent, and in the size of its fruit, which is frequently that of a hen's egg. The strawberries, like those of Europe, are generally red or white, but those that are yellow are also to be found in the provinces of Puchacay and Huilquilemu, where they attain greater perfection than elsewhere.* The strawberry of

* The strawberry of Chili is an hermaphrodite and dioecial, and the plants brought by Frazier to Europe were probably only some female hermaphrodite shoots, which produced fruit in consequence of being impregnated by some of our strawberries which were in the vicinity. Had the author been in a situation to have become acquainted with this circumstance, he would not have called that degeneration which is merely the result of an unnatural fecundity.

The want of male plants, as appears from Miller, is also the reason of the English having abandoned the cultivation of his strawberry.—*Fr. Trans.*

Chili was introduced many years since into Europe, and I have seen in the botanic garden at Bologna the white kind, which is the most common in Chili, but it had lost much by transplantation; its fruit was small, and little of the fragrance was left which renders it so highly esteemed in Chili.*

The madi (madia. gen. nov.) Of this plant there are two kinds, the one wild, the other cultivated. The cultivated, which I have called *madia sativa*, has a branching hairy stalk, nearly five feet in height; the leaves are villous and

* We found in the desert strawberries of a very fine flavour, equal in size to our largest nuts, and of a pale white; and although they resembled the European neither in colour nor in taste, they were nevertheless excellent.—*Feuillé*, vol. i.

There are whole fields where a species of strawberry is cultivated that differs from ours in its leaves, which are rounder and more fleshy and hairy; the fruit is usually the size of a nut, and sometimes that of a hen's egg. The colour is a whitish red, and the taste not so delicate as that of our strawberries. But there is not wanting in the woods a great plenty of the European kind.—*Frazier's Voyage*, vol. i.

The fruits most abundant in Chili are of the same kinds with those known in Europe, among which are cherries that are large and of a delicate taste, strawberries of two kinds, one called *frutilla*, which is of the size of a small hen's egg; and another, in colour, smell and taste, like that of Spain, which grows wild at the foot of the little hills; likewise all kinds of flowers are found there without any other cultivation than what they receive from the hands of nature itself. —*Ulloa's Voyage*, 2d part, vol. iii.

placed by threes; they are four inches in length, half an inch in breadth, and of a bright green like the leaves of the rose laurel; its flowers are radiated and of a yellow colour; the seeds are convex on one side, and covered with a very thin brownish pellicle on the other; they are from four to five lines in length, and enclosed in a spherical pericarpium of about eight or nine lines in diameter. An excellent oil is obtained from the seeds, either by expression, or merely boiling them; it is of an agreeable taste, very mild, and as clear as the best olive oil. Feuillé, who resided three years in Chili, praises it highly, and gives it the preference to any olive oil used in France.* This plant, hitherto unknown in Europe, would become the most valuable acquisition to those countries where the olive cannot be raised. The wild madi (madia mellosa) is distinguished from the other by its leaves, which are amplexicaul and glutinous to the feeling.

The pimento (capsicum) called by the Indians *thapi*. Of this plant many species are cultivated in Chili, among others the annual pimento, which

* From the seed of this plant is obtained an admirable oil, which the inhabitants of the country use in various ways—to alleviate pain by rubbing with it the diseased part, to season their victuals, and also for light. To my taste it is sweeter and more pleasant than most of our olive oil which it resembles in colour.—*Feuillé*, vol. iii.

is there perennial, the berry pimento, and the pimento with a subligenous stalk. The inhabitants make use equally of all the three to season their food.

Besides those which I have mentioned, the Chilians make use of many other excellent plants, which, though natural to the country, require a more attentive cultivation; of these the principal are the umbellifera, the bermudiana or illmu, and the hemerocallis of Feuillé. The umbellifera, or heracleum tuberosum, in its leaves, flowers, and seed resembles the illmu, but is distinguished from it by the quantity of its bulbs, which are six inches long and three broad; the colour of the bulbs is yellow and their taste very pleasant, it grows naturally in sandy places near hedges, and produces abundantly.

The bermudiana bulbosa, or the illmu of Feuillé, has a branchy stalk, and its leaves are very similar to those of the leek; the flower is of a violet colour, and divided into six parts, which are turned back towards the foot-stalk; it has six stamens and a triangular pystil; the seeds are black and round, and the bulbs when boiled or roasted are excellent food.*

The hemerocallis, or, the *liuto* of the Indians,

* The natives of the country make use of the root of this plant in their soups, and it is very pleasant to the taste, as I have myself experienced.—*Feuillé.*

has a stalk of a foot in height; the leaves are pointed and embrace the stem, which divides itself at the top into a number of pedicles bearing a beautiful red flower of the shape of a lily. The root is bulbous, and yields a very light white and nutritious flour, which is used for the sick.

The liliaceous plants offer a great variety throughout Chili, and are known to the Araucanians by the generic name of *gil*. I have collected myself more than twenty-three different species of them, many of which were adorned with superb flowers.

In the province of St. Jago is found a species of wild basil (ocymum salinum) differing in its appearance from the common or garden species only in its stalk, which is round and jointed; but in its smell and taste it resembles more the alga, or sea-weed, than the basil. This plant continues to increase in growth from the first opening of the spring to the commencement of winter, and is every morning covered with saline globules that are hard and shining, and give it the appearance of being coated with dew. The husbandmen collect and make use of this salt instead of the common kind, which it far exceeds in taste. Each plant produces daily about half an ounce, a phenomenon, the cause of which I am not able satisfactorily to explain, as it grows in a very fertile soil exhibiting no appearance of salt, and at more than sixty miles distance from the sea.

Sect. III. *Herbs used in Dying.*—From time immemorial have the Chilians made use of indigeneous plants for dying; and such is their excellence, that they communicate the liveliest and most durable colours to their cloths, without the aid of any foreign production.* I have in my possession a piece of cloth dyed in that country, which in thirty years use has lost nothing of the original lustre of its colours, which are blue, yellow, red, and green, neither from exposure to the air, nor the use of soap. The natives of the southern provinces obtain a blue from a plant with which I am unacquainted; but in the Araucanian and the Spanish possessions they make use of indigo diluted with fermented urine, which gives to the substance dyed a beautiful and durable colour.

Red is obtained from a species of madder called *relbun* (rubia Chilensis). It usually grows under shrubs in sandy places; its stalk is nearly round, the leaves oval, pointed and whitish, and placed by fours as in the filbert; its flowers are monopetalous, and divided into four parts;

* Besides the medicinal herbs, they have others for dying, the colours of which are very durable, and do not change in washing. Among these is the *reilbon*, a species of madder, with a leaf somewhat less than the European, the root of which is boiled in water in the same manner to extract the dye. The poquel is a species of southern wood, of a golden colour.—*Frazier*, vol. i.

the seed is contained in two little red berries, which are united like those of the European madder; the root is red, runs deep into the earth, and its lateral fibres frequently occupy a space of many feet in circumference.

A species of agrimony (eupatorium Chilense) known in the country by the name of *contra* yerba*, furnishes the yellow. This plant has a violet stalk of about two feet in height, divided by small knots, from whence issue the leaves in pairs opposite to each other; they are of a bright green, three or four inches in length, narrow and indented; the branches are axillary, and produce some flosculous flowers of a yellow colour, resembling those of the agrimony. In the centre of the flower a small worm is almost always discoverable, whose body is composed of eleven very distinct rings. A yellow is also obtained from the *poquel* (santolina tinctoria) a species of cress, with long and narrow leaves resembling wild flax; it puts forth three or four stalks two feet in height, striated and crowned at the top with a yellow semi-globular flower, composed of several small ones. The stalks furnish a green colour.

The root of a perennial plant, called *panke* (panke tinctoria, gen. nov.) furnishes a fine black,

* This name implies, that it was considered as a antidote against poisoned arrows.—*E. E.*

and is acknowledged to be one of the most useful plants in Chili. Some writers have given it the name of bardana Chilensis, from the resemblance of its leaves to those of the burdock, although its fructification is entirely different. The root is very long, frequently five inches thick, rough and black without, and white within. The leaves are attached to long petioles, and are palmated; they are of a bright green above, and ash-coloured beneath, frequently two feet in diameter, and of a subacid taste. From the centre of the radical leaves shoots up a single stalk, five feet in height and three inches thick, covered with a rough bark furnished with thorns. This stalk has no leaves except at the top, where there are three or four much smaller than those at the root, surmounted by a large conical fasciculus, or bunch, which produces the flowers and the seed; the flowers are white, a little inclining to red, bell-shaped, and monopetalous; the seed is greenish, round, and enclosed in a capsule of the same form.

This plant is peculiar to moist places, and it always perishes when not supplied with water. It grows more luxuriantly and to a larger size in the valleys between the Andes, where it frequently exceeds the height which I have mentioned; in low grounds near the sea it is only of a moderate height. The black for dying is obtained from the juice of the root, and it might answer equally

well for ink, as its viscosity and the beautiful black it acquires from time, give it all the requisite qualities. It is also used for tanning leather; but for this purpose it becomes necessary to pound it, and the smell it exhales is so strong, that the workmen can rarely endure it above half an hour at a time. The stalk contains a white pith of an acidulous taste, which the country people eat in summer,* and the shoe-makers use the wood for their lasts, as they believe it more durable than any other. Another species of the panke (panke aculis) called in the language of the country *dinacio,* grows in sandy and moist places; the root is of the shape of a turnip, as large as a man's arm, and of a sweetish taste; it is highly esteemed by the inhabitants, but produces no kind of dye. This plant is without a stalk, and puts forth from the root a group of small leaves, ornamented in the centre with a bouquet of flowers similar to those of the preceding.

The Chilians obtain a violet colour from the berries of several shrubs; but the *cullé,* which I have mentioned among the alimentary herbs,

* This plant is refrigeratory, and a decoction of the leaves is given in fevers. The ends of the leaves, stripped of their exterior covering, are also eaten raw, and of a sweet and very pleasant taste. The dyers make use of the root to obtain a black, by cutting it into small pieces, which they boil with a certain portion of black earth, and the tanners prepare their skins by soaking them with it in warm water.—*Feuillé,* vol. ii.

produces that which is most esteemed; it is reduced into the form of paste like the woad, and the dyers make use of it in the same manner. After the first autumnal rains a small plant springs up in the fields, called *the herb of rosoli*, which appears to be of a new genus, and which I have denominated *sassia tinctoria*. It bears three or four quadripetal flowers of a purple hue, which are used to colour and to communicate an agreeable flavour to a kind of liqueur called *the purple*. A single flower, although smaller than that of thyme, will colour five or six pounds of liquor. The cabinet-makers likewise make use of it to stain their work. I am of opinion that this plant might be advantageously employed in the dying of wool and linen, particularly the latter, since merely by tinging it with the expressed juice of the flower, it acquires a beautiful colour that continues a long time. Of the same genus is the sassia perdicaria, called by the inhabitants *rimù*, or the partridge flower, from its being the favourite food of that bird. It bears but one flower, of a golden yellow, similar in form to that of the panke tinctoria, which gives a beautiful appearance to the meadows, where it is found in great abundance in autumn. The Chilian names of the months of April and of May are derived from that of this plant, April being called *unen-*

rimù, the first rimù, and May, *inan-rimù*, or the second rimù.

Sect. IV. *Medicinal Plants.*—A knowledge of the virtues of plants and herbs, acquired by long experience, forms almost the whole of the medical science of the Chilians, particularly of those aborigines who have never embraced christianity. The *machis* and *ampives*, names given to their physicians, are only skillful herborists, who, in reality, often perform extraordinary cures. The virtues of many plants are known only to them, as, either from hatred to the Spaniards, or to enhance their own consequence, they studiously conceal their properties: notwithstanding which, near two hundred valuable medicinal herbs have been discovered, besides a great number of shrubs and trees, which at present form an important branch of foreign commerce, the most celebrated of which are the *cachanlahuen*, the *viravira*, the *retamilla*, the *payco*, and the *quinchamali*.

The *cachanlahuen* (gentian cachanlahuen) called by M. Bomare and some other authors *chancelague* and *chanchalagua*, is not a native of Panama, as is stated in the Memoirs of the Academy of Sciences for 1707; nor does it grow, as M. Bomare has mentioned, in Guayaquil, but only in Chili, from whence it has been trans-

ported to the other parts of America, and to Europe. This plant is a species of the centaury, and greatly resembles the common kind, but it differs from it in having a rounder stalk, a less fibrous leaf, and branches opposed to each other in pairs placed almost horizontally. Its name in the Chilian signifies the herb for curing the pleurisy, in which complaint it is found very efficacious; it is also considered as purgative, dissolvent, worm-destroying, an excellent febrifuge, and a specific for the sore throat.* The infusion of it is extremely bitter, and in its smell resembles the balsam of Peru.

The *viravira* (gnaphalium viravirą) is a species of houseleek very aromatic; it is recommended in intermitting fevers; the infusion is an excellent sudorific, and the Chilians make

* This plant is extremely bitter; an infusion of it is aperient and sudorific; it strengthens the stomach, destroys worms, frequently cures intermitting fevers, and is very serviceable in rheumatic complaints.—*Feuillé*, vol. ii.

The cachenlahuen, or the canchalagua, which is called cahenlagua in Chili, is very similar in its appearance to the smaller European centaury, although not so high. A decoction of it in warm water, in the manner of tea, is considered an excellent purifier of the blood. This plant is highly celebrated in Chili, from whence it is exported to other parts, as a febrifuge. I think it preferable to the European centaury, and it is considered as very efficacious in complaints of the throat.—*Pernetty's Voyage*, vol. i.

use of it in catarrhal complaints. The leaves are extremely villous, and appear to be covered with cotton; the flowers, which do not exceed four, are composite and flosculated, they are of a golden colour and placed at the top of the branches, and the seed resembles much that of the stoechas citrina.*

The *retamilla* (linum aquilinum) or *gnancu lahuen*, grows usually at the foot of the mountains. The root is very long and perennial; it puts forth several branchy stalks, furnished with small alternate lanceolated leaves; the flowers are yellow, with five petals, and are attached by pairs to a common pedicle; the pystil becomes changed into a membranaceous pentagonal capsule, containing a number of little seeds. This plant possesses the same virtues as the viravira, and is used in the same cases.

* Among the herbs that cover the mountains there are many that are aromatic and medicinal; of the latter, the most in esteem with the country people is the cachinlagua, or little centaury, which appears to me to be bitterer than that of France, and, of course, more abundant in that salt which is considered as an excellent febrifuge. The viravira is a species of houseleek, an infusion of which was found to be very serviceable by a French surgeon in the cure of tertian fevers. There is also a species of senna perfectly resembling that of the Levant, in the place of which it is used by the apothecaries of St. Jago; it is called by the Indians *unoperquen*.—*Frazier's Voyage*, vol. i.

The *payco* (herniaria payco*) by which name it is known in many modern medical works, is also denominated tea of the third species, although it appertains to the genus of herniaria. It puts forth several trailing shoots, covered with small oval leaves, notched like a saw, and attached to the stalk without a petiole. The flowers have many stamina, and are very numerous; the seed is enclosed in a spherical capsule; the colour of the plant is a light green, and its smell is something like that of a rotten lime. As a medicine it promotes digestion, is excellent in complaints of the stomach, and very useful in the pleurisy.†

The *quinchamali* (quinchamalium Chilense). As this plant forms a new genus, I have retained the name by which it is known in the country; it produces a great number of stalks of nine inches in height, with alternate leaves similar to those of the linaria aurea tragi; the flowers are

* All the plants of the genus herniaria that are known, and those that have an affinity to them, as the ilecebrum, the achyrantes, &c. have their leaves entire, without being jagged or indented; of course this instance presents an exception from the general rule.—*Fr. Trans.*

† The payco is a plant of middling height, whose leaves are a little dentated, and have a smell like a rotten lime; a decoction of them are sudorific, and are good in pleuritic complaints. There is likewise a great quantity of bastard rosemary, which produces the same effects.—*Frazier's Voyage*, vol. i.

umbellated, yellow, and tubulous, with a border divided into four parts like the jessamin; the seed is black, lenticular, and enclosed in a spherical capsule, containing three cells. The country people make use of the expressed juice, or the decoction, as a resolutive after falls or bruises, and it is found to be an excellent remedy in cases of that kind.* Feuillé, whose memory will be ever dear to the Chilians, has furnished an account of a great number of medicinal plants, with very accurate delineations of them. I shall, however, merely mention a few of the principal ones; as the *pichoa*, the *clinclin*, the *guilno*, all of which are purgative plants; the *diuca-lahuen*, a good vulnerary medicine; the *sandia-lahuen*, serviceable in menstrual suppressions; the *corecore*, a specific for the tooth-ach; and the *guilhue*, much esteemed as a purifier of the blood.

Tobacco, called by the Indians *puthem*, is of two kinds, the cultivated and the wild. The

* A drink made of the decoction of a certain herb called quinchamali is esteemed as an infallible remedy for the bleeding of the nose, when caused by a fall or violent blow. It is a species of the lavender, which bears a small red and yellow flower. Many of the medicinal herbs that we have in France are also natural to the country; as several species of the maiden-hair, some of which are equal to the Canadian, the mallows, the fox-glove, polipody, spleenwort, and some others whose names I am unacquainted with.—*Frazier's Voyage*, vol i.

cultivated is subdivided into the common tobacco, which is equal to the best Brazilian, and the little tobacco (nicotiana minima) whose leaves resemble those of the Cretan dittany; its fructification is like that of the common kind, but the tobacco itself is much stronger, and more violent in its effects.

Sect. V. *Grasses.*—The banks of the rivers and other moist places produce in general a great number of reeds and rushes, many of which are unknown to botanists. A species of the latter, which I have called *scirpus elichnarius*, serves to make wicks for candles. This rush grows to the height of about four feet; the stem is is round; from the top protrude three sword-shaped leaves, in the midst of which are four globulous spikes or heads.

From a species of rush, produced in the valleys of the Andes, the Araucanians manufacture baskets of so close a texture as to hold water, which are employed for many domestic purposes. Of these great numbers are sold at the annual fairs in the Spanish provinces. But notwithstanding I have been assured by many that the plant employed in this manufacture is a real rush, from examination I am more inclined to believe it a species of cane, as its fibres are woody, and the whole substance very solid.

Among those rushes whose characters are well

defined, the solid rush of Chili deserves to be noticed: of this there are many kinds, comprehended under the general name of *coliu*. All these rushes resemble the bamboo; they have a smooth, hard, yellowish bark; the inside is generally filled with a filaceous substance, a little harder than cork; the leaves are long and very slender, and grow upon several little branches into which the top divides itself. The three most remarkable kinds are the *rugi*, the *quila*, and the *rush of Valdivia*.

The *rugi* (arundo rugi) is about as large as the common European rush, which is also well known in Chili. At the foot of the Andes this plant often grows to the height of twenty feet, but diminishes considerably as it approaches the sea, where it scarcely attains twelve.

The *quila* (arundo quila) is three or four times larger than the *rugi*, but its shoots are not more than a foot distant from each other.

The *rush of Valdivia* (arundo Valdiviana) has received this name from the circumstance of its growing in the vicinity of that city; it is of an orange colour; the shoots are very short, and the joints almost touch each other. The country people make of it cages and other little manufactures; they also use it for their hedges, and sometimes to cover their houses, as it is very durable when it has not been too long exposed to moisture. The Araucanians make use of the

quila for their lances, and the rush of Valdivia for canes, which are much esteemed.

Sect. VI. *Climbing Plants.*—Climbing plants, or creepers, are found in great abundance in all the thickets. Several of the most beautiful are employed to decorate the trellices of gardens. Among others, the *copiu* deserves to be noticed; its flowers, each of which is composed of six petals, three inches in length, are of the most beautiful crimson, spotted within with white. This plant climbs up the highest trees; its leaves are disposed by threes, and are of a beautiful green, and an oval shape; the fruit is an inch in diameter, cylindrical, of a dull yellow, and contains a white tender pulp of a sweet and pleasant taste. In Chili is likewise found the *passion-flower* (passiflora tiliæ folia) the *caracol*, the *sarsaparilla*, the *alstroemeria salsilla*, and four or five other species of those vines called by the French *lianes*, and by the inhabitants *voqui*. One of the most useful is the *cogul* (dolichos funarius). The vine is round, and ligneous, and of the size of pack-thread, and its flowers resemble those of the copiù. It climbs upon the trees like the ivy, but without attaching itself to them. When it reaches the top of a tree, it descends from it perpendicularly, and as it continues to grow extends itself from

tree to tree, until at length it offers to the eye a confused tissue, exhibiting some resemblance to the rigging of a ship. This singular plant produces a leguminous flower of a purple colour; its pod is an inch thick, and about a foot and a half long; it contains an oily pulp of a sweet and very agreeable taste, and five seeds resembling those of the cotton. The vine, which is much tougher and more flexible than osier, serves for many purposes, and can be procured from one to two hundred fathoms in length, as when it descends it does not take root in the earth, like another plant analagous to it, which is a native of the torrid zone. The husbandmen, before they make use of this vine, pass it lightly through the flames, which not only loosens the bark, but at the same time renders it more flexible. They employ it both in making large baskets, and as wattling for their hedges; it is sometimes even used in cables for vessels, which wear better than those made of hemp, as they are capable of resisting moisture for a longer time. In the Archipelago of Chiloé is another plant called *pepoi,* in some respects resembling the cogul, which the inhabitants of those islands use as ropes for their periaugres. The *voqui,* or *vochi,* described by Feuillé, which commonly grows in the woods of the maritime provinces, is of a distinct species, as is the *urceolaria* of the

same author, the flower of which is an inch in length, and is divided into five equal lobes of a beautiful red.

Sect. VII. *Shrubs.*—In my catalogue of the plants of Chili I have noticed more than fifty-three indigenous shrubs; but I am convinced, if an opportunity had been afforded me of exploring a greater extent of country, that I might have more than doubled that number. Every province or district offers some variety in this class of vegetables of more or less utility to the inhabitants.

The bark and leaves of the shrubs called *deu, thilco* and *uthiu,* serve to dye black. The berries of the *tara* (poinciana spinosa) and of the *mayu,* furnish a black juice which is a good substitute for ink. The *guiacum,* which in Chili never acquires the size of a tree, is employed in turnery. The cabinet-makers use, for inlaying, the wood of several shrubs whose appropriate names I am unacquainted with, but which, from their hardness, are generally called ebony wood. The wild rosemary and several other resinous shrubs, are used as fuel in the furnaces for melting copper. The wood of the *colliguay* (colliguaja, gen. nov.) when burnt, exhales a very agreeable smell like roses, without producing the least inconvenience.

The incense is not inferior to that brought

from Arabia, and is obtained from a shrub that grows in the province of Coquimbo, to which I have given the name of *thuraria, gen. nov.* It usually grows to the height of four feet; the trunk is of an ash colour, from whence proceed a great number of branches loaded with oval leaves that are alternate, four inches long, rough, very succulent, and of a pale yellow; the flowers are small, funnel-shaped, and of a light green; the capsule is spherical and divided into two cells, containing as many elongated seeds of a brown colour. In the summer the incense exudes through the pores of the bark around the limbs in the form of little drops or tears, and is collected in great quantities in the autumn, when the leaves begin to fall. The globules are hard, white, transparent and shining, and have a bitter taste and a highly aromatic smell. In the hills near Valparaiso is found a species of sunflower with a ligneous trunk, which produces a resinous substance resembling incense.

The trunk of the *puya* (puya, gen. nov.) is used for cork throughout Chili. This shrub has a great resemblance to the anana. From its root issue three or four monstrous shoots of a conical form, as large as a man's body, but not exceeding twenty inches in length; these are covered with a spongy bark, disposed in the manner of scales; from the top of these shoots or trunks proceed the leaves; these are four feet

long, furnished at the sides with crooked prickles, perfectly similar to those of the anana; from the centre of the leaves rises a stalk, nine feet in length, and three inches in diameter, covered with a very hard green bark, enclosing a whitish spungy substance resembling cork. At the top the stalk is divided into a number of branches covered with leaves, much smaller than those of the root, and with yellow flowers, four inches long, composed of six irregular petals, which form together a large and beautiful pyramid. This singular vegetable produces no other fruit than a triangular capsule, containing a great number of very small black seeds. The nectaries of the flowers are always filled with honey, which is eagerly sought after by the children. The Araucanian provinces furnish several varieties of this plant, from whence the inhabitants collect great quantities of honey.

Besides the kali of Alicant (salsosa kali) which grows in great abundance on all the marshes of the sea shore, a climbing shrub is found on the coast of Coquimbo, from whence the soap-boilers obtain large quantities of alkaline salt.

Chili produces seven species of the myrtle, all estimable for their beauty and fragrance. But the most valuable is the one called by the Indians *ugni*, and by the Spaniards *murtilla*. The French, who found it in the Malouine islands,

have given to this shrub the name of *lucet muscat.** It usually grows to the height of four feet, and resembles much the myrtle of Tarentum, its branches and leaves being placed opposite each other in pairs; the flowers are white, have five petals, and produce a round or red berry, the size of a small prune, marked with four green points like the pomegranate. This fruit contains several seeds that are flat and brown, and has a very pleasant aromatic smell, perceptible at a great distance. The inhabitants obtain from it a very agreeable odoriferous liquor, which is preferred by foreigners to the best muscat. It requires a long time to ferment, but, when once clarified, is very clear, and has a delicious taste. Before the arrival of the Spaniards and the introduction of the grape, the natives used to prepare vinous liquors from several kinds of shrubs, at present neglected; among these were two or three species of the Indian fig, or opuntia, called by the Chilians *tuna*, whose fruit is very fine, and as large as the best European figs.

A great number of shrubs, from time imme-

* Its fruit is of a beautiful appearance and very pleasant taste; by being put into brandy with a little sugar, it forms a very delicious liquor, which has in a slight degree the smell of amber and of musk, by no means disagreeable even to those who dislike those perfumes.—*Pernetty's Voyage*, vol. ii.

morial, have been employed as efficacious medicines by the physicians of the country. Among these is the *cullen* (psoralea glandulosa) well known in Europe; it is considered as a powerful vermifuge, and one of the best stomachics; the leaves are used in infusion, and from their aromatic taste are by many preferred to tea, and occasionally serve as a substitute for it. This shrub is indigenous to Chili, where it grows spontaneously, and frequently attains the height of a common sized tree. There is another variety which is called the *yellow cullen*, from the colour of its leaves, which, like those of the other, are disposed by threes, but are very thin and crisped, and, conglomerating towards the end of the limbs, form at the top of the tree a thick globular tuft that frequently causes the branches to bend. Its flowers, like those of the other species, are leguminous, the seed solitary, and the leaves of both are vulnerary and very balsamic.*

* The albaquilla, in Indian *cullen*, is a shrub whose leaves emit an odour like that of the sweet basil, and produce a balsam of great efficacy in the cure of wounds, as I witnessed in the case of an Indian at Irequin, who had received a very deep one in his neck, and I have also experienced the beneficial effects of it myself. The flower is large, of a pale violet, and disposed upon spikes, and is one of that species comprehended in the class of the leguminous. Another shrub, called *harillo*, is employed for the same purpose. This is different from the *harillo* of Tucuman, and its leaves, which are very small,

The *guaicuru* (plegorhiza guaicuru, gen. nov.) grows in the northern provinces. The root is rough and of a red colour, and is used as a specific for all kinds of wounds; it puts forth a great number of leaves resembling those of the myrtle, in the centre of which rises a stem of about six inches in height, divided at the top into many branches covered with leaves less than the radical, and very small bell-shaped flowers arranged in an umbellate order. Pernetty, in his Voyage to the Malouine Islands, observes, that this plant, particularly the root, is one of the most powerful vegetable astringents known, and is likewise very excellent for the cure of ulcers and scrophulous complaints, and of great service in the dysentery—properties ascertained by the daily experience of the Chilians.

In the province of Quillota is a species of the acacia, or mimosa, called by the Spaniards *jarilla*, which affords a balsam of great efficacy in healing wounds. This balsam exudes from the branches and the leaves, and renders them viscous to the touch; it exhales a very agreeable odour which is perceptible at a great distance. The jarilla grows to about five feet; the leaves are winged and notched at the edges; the flowers are yellow and divided into five petals, and

emit a strong smell something like that of honey, and are so replete with balsam that they appear to be covered with it.—*Frazier's Voyage*, vol. i.

produce a small berry, containing two or three kidney-shaped seeds.

The expressed juice of the *palqui* (cestrum nocturnum) is considered as the best known remedy for inflammatory fevers; it is bitter and of an unpleasant taste, but very cool and refreshing. The leaves of this shrub were formerly considered by the husbandmen as poisonous to cattle, but modern experiments have proved the unfoundedness of this opinion. In its appearance and smell the palqui resembles the elder, but the leaves are single, alternate and oblong; the flowers are corymbic, yellow, and like those of the jessamin, and the berries oval and of a purple colour. The wood is very brittle, but is preferred to any other by the Indians for the purpose of producing fire by friction according to their custom. This is done by turning rapidly between their hands a small stick of this wood in a hole made in another piece of the same kind.

Among the shrubs used for medicinal purposes is also the cassia sena, which is in no way different from that of the Levant. It grows in abundance near the source of the river Maypo. Sage is likewise found in many places, particularly in the low grounds near the sea.

Sect. VIII. *Trees.*---The forests of Chili offer a great variety of trees, the most of which

never lose their foliage. Those kinds that are known, amount to ninety-seven, and of these only thirteen shed their leaves. Among the former are many that are remarkable for their fragrance,* and are well deserving cultivation. Those that are similar or vary but little from the European trees, or which are to be met with in almost all botanical gardens, I shall merely enumerate, reserving my descriptions for such as are less known, or distinguishable for some peculiarity.

The valleys of the Andes produce naturally the white cedar and the red, called *alerces*, the cypress, the pine, and the *pellinos*, which is a species of oak. All these trees grow to a great

* The woods are full of aromatic shrubs; such as several kinds of myrtle, a species of laurel whose leaves are of the smell of saffron, but more pleasant; the *boldu*, the leaves of which have the odour of incense, and the bark a biting taste something like that of cinnamon; it is a different tree, however, from that called the cinnamon, which produces a bark similar to that of the East Indies. The leaves of the boldu are like those of the greater laurel, but rather larger. There is also another tree called *peumo*, a decoction of the bark of which is very beneficial in the dropsy. The fruit is red, and resembles an olive, and the wood is very proper for ship-building; but the best tree for this purpose is a species of evergreen oak, very hard and durable, whose bark is a cork equal to that of the cork tree. On the shores of the river Bio-bio are great quantities of cedar suitable for building, and excellent for spars. The bamboo reed is likewise very common in every part of the country.—*Frazier's Voyage*, vol. i.

height and size, but none of them can compare in that respect with the red* cedar, which, in the Archipelago of Chiloé, grows so large, that a single tree will frequently furnish from six to eight hundred boards of twenty feet in length.

In the other parts of Chili are found the willow, the *molle*, the Peruvian taper or cherry, the wild orange, the *floripondio*, the white cinnamon, the carob tree, the *maqui* a species of cornel, the *luma* a species of myrtle, the mulberry, the *chirimoya*, and the tamarind. The island of Juan Fernandes produces the red, yellow, and white sandal, the yellow wood, or *fagus lutea*, and a tree whose genus I am unacquainted with, that produces a species of pepper inferior to that of the East Indies.

The *theige* (salix Chilensis) differs from the European willow in its leaves, which are entire, slender, and of a yellowish green. This tree yields annually a great quantity of manna; the country people also make use of the bark, which they believe possesses a highly febrifugal quality.

Of the *molle* there are two kinds, the common

* On my passage from Chili to Europe I observed that the water which was in casks made of the red cedar, kept sweet for a much longer time than that in the others. This water had acquired a red tinge, but the taste was not in the least changed, and it appeared to be as fresh as if just taken from the fountain.

(schinus mollis) which is usually found in the marshes, and another called *huigan* (schinus huigan). The last grows naturally in any soil, and its leaves are very small. The inhabitants prepare from the berries of these trees a kind of red wine of an agreeable flavour but very heating.*

The Peruvian taper, called in Chili *quisco*, is of two kinds, the common (cactus Peruvianus) and that of Coquimbo (cactus Coquimbanus) the thorns of which are eight inches long, and are used by the women for knitting-needles.

The *floripondio* (datura aborea) is a tree much esteemed for its beauty and the fragrance of its flowers, which diffuse an ambery odour to a great distance.† The trunk grows to the height of twelve feet, but rarely exceeds six inches in diameter, and is pithy within. The branches

* The Indians prepare a beverage from the molle as pleasant and as strong as wine, if not more so, and make use of the solution of the gum as a purgative medicine. The sap, procured by making an incision in the bark, is said to be a cure for films, and a liquor obtained from the pith of the young shoots, excellent for clearing and strengthening the eyes. The fishermen of Concon and Valparaiso boil the bark, which produces a dye of the colour of burnt coffee, with which they stain their nets.—*Frazier's Voyage*, vol. i.

† We have no tree in Europe that equals in beauty the floripondio. When in blossom it far exceeds in fragrance any of our trees, and one of them is sufficient to perfume a whole garden.—*Feuillé*, vol. ii.

unite at the top and form a spherical crown, which produces a most delightful effect. The leaves are woolly and in the form of an elongated heart eight or ten inches in length, by three in breadth; the flowers are turned back in the form of a funnel, and are divided into five pointed lobes; they are white, from eight to ten inches long, and three in breadth. The fruit is nearly round, of the size of an orange, and covered with a greenish rind, containing a number of oval seeds, but it is never eaten.

The wild orange tree (citrus Chilensis) is distinguished from the cultivated by its sessile leaves, and its fruit, which is oval and not larger than a filbert, but has the taste of a common orange. This tree frequently grows to a considerable height, and the wood is much esteemed by turners on account of its beautiful yellow colour.

The white cinnamon, called by the Chilians *boighe*, and the Spaniards *canello*, may be found in all the thickets of Chili. It is commonly known by the name of Winter's cinnamon, from its being first introduced into Europe by Captain Winter.* The trunk of this tree frequently

* The boighe of Chili, or canello of the Spaniards, is not the tree which furnishes the white cinnamon of merchants, and, of course, not the same with that described by Linnæus under the name of winteriana canella. The boighe of Chili is a real

rises to the height of fifty feet; the branches are placed opposite each other by fours, in the form of a cross; the leaves are large, alternate, and like those of the laurel; the flowers are white, quadripetal, and very odoriferous; the berries oval, and of a changeable black and blue. Like the cinnamon of Ceylon, this tree produces two barks; the exterior of a greenish brown, the other, when first taken from the tree, is of a dirty white, but when dry, becomes of the colour of the true cinnamon, which it very much resembles in taste, and in Feuillé's opinion might serve as a succedaneum for it.* I am of the same sentiment, particularly if proper attention were paid to the cultivation of it, which would probably tend to correct that sharp taste which renders it unpleasant. The natives employ the timber for building, but make no use of the bark. The Araucanians from time immemorial have regarded the boighe as a sacred tree; in their religious ceremonies they carry branches of it in their hands, and when they conclude a peace, they present them in token of amity and alliance,

drymis, and appears to be the same with that described by the Chevalier de la Mark, under the name of drymis punctata. —*Fr. Trans.*

* The bark of the boighe may be applied to the same uses as the cinnamon; its smell is similar, and it acquires the same colour when it is dried.—*Feuillé*, vol. iii.

as the ancient nations of Europe did those of the olive.

The *carob tree* of Chili (ceratonia Chilensis) is distinguished from that of Europe (siliqua Europea) by its thorns, which are usually four inches long, and so hard that they are used by the country people instead of nails. Its pod resembles that of the European carob.

The *maqui* (cornus Chilensis) does not usually exceed ten or twelve feet in height, and the wood is too brittle for use. The leaves are opposite, heart-shaped, denticulated, juicy, and three inches long; the flowers are white, with four petals, and the berries purple. The Indians eat these berries or wild grapes, which are very sweet, and also prepare from them a beverage called *theça*. The juice of the leaves is esteemed a specific in the sore throat, and I am convinced of its efficacy from my own experience. There is a variety of this tree which bears a white berry.

The *luma* (myrtus luma) is distinguishable from the common myrtle by its round leaves and its height, which is frequently forty feet. Its wood is the best of any known for the use of coach-makers, and large quantities of it are annually exported to Peru for that purpose. The Indians make from the berries a pleasant wine, in high repute as a stomachic. There is likewise another species of lofty myrtle (myrtus

maxima) which grows in the same places with the luma, and frequently to the height of seventy feet; the wood of this is also very valuable.

Among those trees which produce the most useful woods, besides the cedars already mentioned, are the *caven*, the *quillai*, the *lithi*, the *mayten*, and the *temu*.

The *caven* (mimosa caven) called by the Spaniards *espino*, resembles much the accacia folio scorpiodis leguminosa of Egypt. The trunk is winding and solid; the bark black and filled with cracks; the branches scattered and furnished with thorns; the leaves disposed in pairs on a common footstalk, and two inches in length; the flowers are flosculous and yellow, and form a round bouquet like those of the acacia nilotica, but differ in being attached without peduncles to the boughs, which they completely cover, and their odour is so very fragrant that they are denominated *aromas*. The pod is from three to four inches long; it is cylindrical, of a dark brown, and contains many oval seeds marked with a yellow stripe; these are enveloped in an astringent mucilage, from which a very good ink is made. The caven grows spontaneously in all the midland provinces, chiefly between the 24th and 37th degrees of latitude, where its wood serves as fuel. It is more natural to the richest soils, and frequently grows to the height of an oak. The wood is hard and compact, of

a dark brown veined with black and yellow, receives an excellent polish, and is used by several kinds of artisans for the handles of their tools.

The *quillai* (quillaja saponaria, gen. nov.*) derives its name from the Chilian word *quillcan*, to wash. The trunk of this tree exceeds the middle height, and is covered with a thick bark of a greyish ash colour; it divides itself at the top into two or three branches, which produce leaves like those of the ever-green oak; its flowers are also furnished with stamina, but the seed is enclosed in a quadrangular capsule. The wood of the quillai is very hard, and does not easily split, for which reason the country people make use of it for stirrups. But what renders this tree really valuable is the bark, which, when pulverized and mixed with a certain quantity of water, foams like soap, and is efficacious in cleansing woollens and other kinds of cloth. A very considerable commerce is carried on with this bark; the Peruvians particularly import every year great quantities of it.

The *lithi* (laurus caustica) a species of middle sized laurel, is scattered over the whole country.

* The quillai is a tree whose leaves resemble those of the ever-green oak. The bark ferments in water like soap, and is preferable to it for the washing of woollen cloth, but is apt to give linen a yellowish hue.—*Frazier's Voyage*, vol. i.

Its leaves are oval, wrinkled, an inch in length, and of a dark green; the flowers, though much smaller, and the fruit resemble those of the common laurel. The effluvium from this tree, especially in summer, produces painful pustules and swellings on the hands and faces of those who stop beneath its shade. This effect is various, however, with various persons: there are some who are very little, if at all, incommoded by it, while others, who merely pass by the tree, are severely affected; though never attended with fatal consequences, it is nevertheless very troublesome. Great precaution is requisite in cutting the tree, as its viscous juice is extremely caustic; but when dry, the wood loses all its injurious qualities, and is employed for building. Its colour is a handsome red, veined with brown, and it acquires, after having been for some time under water, a very great degree of hardness, which might render it very useful in ship building.* There is another large tree which I have reason to believe is truly poisonous; it usually grows in the vicinity of the sea, is called the

* The lithi is a tree very proper for building ships; it is cut with great care when it is green, but when dry, particularly if it has been for some time under water, the wood becomes almost as hard as iron. It is employed by the natives in building their houses. Its colour when first cut is white, but when it is dried and seasoned it changes to a very handsome red.—*Feuillé's Journ.*

bollen, and is one of the most beautiful trees of Chili. The physicians, however, in critical cases, direct the buds to be taken in powder not exceeding half a scruple, as a powerful emetic. The sap of this tree is a yellow inclining to green, but is not lacteous. Its flowers and fructification I shall not pretend to describe, never having seen it in a flowering state.

The *mayten* (maytenus boaria, gen. nov.) is a beautiful tree, and always retains its foliage. It grows in the same places with the lithi, and is an antidote to its poison. It is rarely more than thirty feet high; its branches, which are numerous, and commence at the height of eight feet from the root, form a very beautiful top; the leaves are denticulated and pointed, about two inches in length, and of a brilliant green; the flowers are monopetalous, bell-shaped, and of a purple hue, but so small as not to be distinguishable at a little distance. These flowers entirely cover the young shoots, and are succeeded by a small round capsule containing a single black seed. The wood is very hard, and of an orange colour spotted with red and green. The cattle are very fond of the leaves, and will forsake any herbage for them; and were it not for the hedges and ditches with which the inhabitants surround the young trees, the species would probably before this time have been destroyed.

The *temo* (temus moscata, gen. nov.) is a tree

of very thick foliage. The leaves are alternate, oval, smooth, and of a bright green. There are two varieties of this tree, distinguished by their yellow or white flowers, which are divided into eighteen narrow petals of two or three inches in length. The seeds resemble coffee, and are not unlike it in taste, but have a certain bitterness that renders them unpleasant. The bark is yellow, the wood grey, very hard, and much used in various manufactures.

The *patagua* (cinodendron patagua, gen. nov.) is much valued for its flowers, which are small, but resemble in shape and smell the lily. The leaves are placed opposite in pairs, lanceolated, serrated, and of a bright green. The trunk frequently grows to such a size that four men can scarcely encircle it with their arms; the wood is white and easily wrought, but held in little estimation.

Chili, in comparison with those countries in America situated between the tropics, produces but few trees whose fruits are edible; the principal of those are the *coconut*, the *pehuen*, the *gevuin*, the *peumo*, and the *lucuma*.

In the provinces of Quillota, Calchagua, and Maúle are large forests of the *coconut* tree (palma Chilensis). This species differs from the others of the same genus in the size of its fruit, which does not usually exceed that of a walnut. The trunk is about the height and

diameter of a date tree, and its growth is very slow; it is without branches and perfectly cylindrical, but when young is covered with the footstalks of leaves, which fall off as the tree increases in size. The leaves and flowers are analogous to those of the palm; the last are monoical, and disposed in four clusters which hang around the tree. When in the bud they are enclosed within a spath, or woody sheath, which opens as the flower expands. When the fruit begins to form, the spath separates itself into two hemispherical parts of about three feet long by two broad. Each of these bunches produces more than a thousand coconuts, and nothing can be more beautiful than to see one of these trees covered with fruit, shaded by the upper branches which bend over in the form of an arch.

The fruit, like the tropical coconut, has two coverings; the outer is hard externally and of a green colour, which gradually changes into a yellow, and the inside is filled with a kind of filaceous wool; the interior shell is woody, smooth and round, and so hard that it would be difficult for the nut to germinate were it not for the two stems which are attached to the upper part of the shell, and separated from the nut only by a thin pellicle. The kernel is spherical, a little hollow in the middle, white, and of a very agreeable taste, and when fresh, contains a milky liquor which is pleasant and refrigeratory.

A great number of these nuts are exported every year to Peru, where they are highly esteemed. The oil obtained from them by expression is well tasted and much used. The country people make use of the sheaths as bags for little articles of dress, and with the leaves manufacture baskets and thatch their cabins. The buds, if cut when young, yield great quantities of sap, which is thick, and furnishes a more agreeable sirup than that of the sugar cane; but the tree commonly dies after this operation.

The date is found in the province of Copiapo; but I know not whether it is indigenous or was brought thither from some other place. The islands of Juan Fernandez produce a species of palm called *chonta*. The trunk, like that of most other palms, is hollow, and the wood is black and as hard as ebony. Another tree, which I have called *ampelo musa*, resembles the palm, and grows in great quantities in the marshes of Maúle; the leaves proceed directly from the top of the trunk, and are large and green like those of the banana; the fruit is disposed in four clusters like those of the vine, and the resemblance is so perfect, that were it not for a sharp and astringent taste, it might readily be mistaken for a grape.

The *pehuen* (pinus Araucana) called by the Spaniards *pino de la tierra*, resembles the fir more than the pine, although in some respects it differs

from both. It is the most beautiful of the trees of Chili, and grows spontaneously in the Araucanian provinces, but is cultivated in all other parts of the country, and, from its properties, partakes of the nature of the pine, the chesnut, and the frankincense. The trunk is frequently eighty feet in height, and its usual circumference is eight; the wood is very resinous, and of a yellowish brown, and the bark smooth and greenish; the tree as it increases in height shedding all the little branches and leaves with which it is covered while young. When it attains the half of its growth it puts forth, in a horizontal direction, four durable limbs opposite to each other in the form of a cross; the four following branches are disposed in the same manner but shorter, and at the distance of four or five feet from the first; the others decrease in length in proportion as they approach the top, which terminates in a point. The extremities of all these branches incline perpendicularly, and give to the tree the form of a quadrangular pyramid. This pyramidal shape becomes still more perfect from the number of little boughs which project laterally from the principal branches in a cruciform manner, decreasing gradually from the common axis. The principal branches as well as the boughs, are set round with stiff leaves enchased in each other, of about three inches long by one broad; these are heart-shaped, con-

vex above, very shining, and so hard that they appear like wood. The flower is amentaceous or conical, and perfectly resembles that of the pine; the fruit is of the size of a man's head; it is smooth, spherical, ligneous, suspended to a very short pedicle, and divided within by two thin shells into several cells, which contain the kernels in pairs; the kernels are about two inches in length and as large as the little finger, of a conical form, a transparent white, and covered with a pellicle like that of the chesnut, which they resemble in taste, and, though rather harder, are* eaten in the same manner. The gum exudes through the bark, is yellowish, and its odour very pleasant.†

* Some of the Quarani tribes reduce them to a flour, and in that state preserve them as food. (Coment. de Cabeze de Vaca). In Chile and to the south they are preserved by boiling, and prepared in this manner, says Falkner, they have something of a mealiness, and taste very like a boiled almond, but not so oily.—*E. E.*

† This is the *dombey of Chili* of M. de la Mark. This tree is not a pine, as M. Molina supposes; it is a new genus, well defined by its fructification, and clearly distinguishable from any of those that are known. In fact, besides its flowers being dicœcial, they have this very singular discrimination, that they grow upon catkins, with no other pericarpium than what is produced by the generative organs—the forked appendages that terminate the props of the stamina forming the pericarpium of the male catkin, and the two valves of each stigma that of the female.

The *gevuin* (gevuina avellina, gen. nov.) called by the Spaniards *avellano*, or the hazle, from the appearance of its fruit, grows to a middle height in marshes and in the valleys of the Andes. Its leaves are winged and terminated with one dissimilar like those of the ash, but the leaflets are rounder, more solid, slightly denticulated, and disposed by four or five couple upon a common pedicle. The flowers are white, quadripetal, and attached by pairs to a spike which proceeds from the hollow part of the leaves. The fruit is round, nine lines in diameter, and covered with a coriaceous shell, which is at first green, afterwards becomes yellow, and at length black; the kernel is divided into two lobes, and in taste resembles the European walnut.

The *peumo* (peumus, gen. nov.) is a tree consisting of four very different species, and a great number of varieties; all of these are tall and covered with stiff aromatic leaves; the fruit is like the olive, but a little smaller, having a ker-

The fruit is also singular; it consists of large oval rounded cones, composed of a great number of elongated seeds, fixed naked around one common axis. These seeds, of course, are not to be found in pairs in the hollow of each scale of the cone as in the pine, since that of the dombeya has no scales.—*Fr. Trans.*

The Spaniards call the resin of this tree incense, and use it as such.—*E. E. Falkner.*

nel more or less hard, according to the species. The flowers are white or of a rose colour, with six petals shorter than the calyx. The first species (peumus rubra) has alternate leaves, oval, petiolated, entire and large, like those of the hornbeam, and bears a red fruit; the second (peumus alba) has denticulated leaves and a white fruit; the third (peumus mammosa) has sessile leaves in shape of a heart, and the fruit is terminated by a kind of nipple; the fourth (peumus boldus) bears oval leaves, placed opposite in pairs, about four inches in length, woolly beneath, and of a dark green. The fruit of this last species is smaller than that of the others and almost round, and the kernel so hard that the inhabitants make their rosaries of it. They also give to the fruit the name of *boldo*, and use the shells to perfume the vessels in which they put their wine. The fruits of the three first kinds are eaten; to prepare them for that purpose they are merely dipped in warm water, as a greater degree of heat would burn and render them bitter. The interior pulp is white, buttery, and of an agreeable taste, and the kernel contains much oil, which might be used both for lamps and for eating. The bark serves for tanning leather, and is also used in dying.

The *lucuma* (lucuma, gen. nov.) comprehends five different species and many varieties, all of them large trees, with stiff leaves resembling the

laurel. The flowers have a great number of stamina, and produce a fruit, which, in size and taste, has some similarity to the peach; the outside skin is yellowish and the pulp sweet, and usually contains one or two kernels of an irregular shape. Two kinds of lucuma are cultivated—the *lucuma bifera* and the *turbinata*. The bifera bears twice a year, early in summer and in autumn; but the autumnal fruits alone produce kernels; these are two, and have the appearance of chesnuts. The fruit is round and a little sloped, but less so than that of the turbinata, which has the form of a whipping-top. Notwithstanding both these fruits ripen upon the tree, it is necessary to keep them some time in straw, which ameliorates them and corrects their natural roughness, and by this means they acquire that pleasant taste which renders them so much esteemed.

Of the wild lucuma three species are known in Chili by the names of *bellota, keule,* and *chagnar*.

The *bellota* (lucuma Valparaidisea) grows in great quantities in the environs of Valparaiso, and is distinguished from the others by its leaves, which are opposite, and its round or oval fruit, which is usually bitter.

The *keule* (lucuma keule) which frequently grows to the height of a nundred feet, has oval leaves about six inches long and of a brilliant

green. This tree usually bears a great quantity of fruit which is perfectly round and of a shining yellow, forming a fine contrast with the beautiful verdure of the foliage.

The *chagner* (lucuma spinosa) has a trunk about thirty feet high; the branches are thorny, the leaves oval and sessile, and the fruit resembles that of the keule, but has a more agreeable taste. The wood is hard, of a yellow colour, and much valued by cabinet-makers.

The different kinds of pulse, flowers, garden herbs, vines, and fruit trees, which the Spaniards have brought from Europe, thrive as well in Chili as in their native country.*

The melons, of which there are many kinds, are almost always long; the rind is very thin,

* Each house has a garden in which may be found all kinds of fruit trees, which produce every year such abundance of fruit that the inhabitants pluck off a great part of it when it first forms, as otherwise it would not only endanger breaking the limbs, but would never come to maturity. The fruits are not inferior in quality to those of Europe, except the chesnut which is much less, but in place of this there are many other kinds of fruit unknown in our climate.—*Feuillé*, vol. ii.

All the houses in Coquimbo have large gardens surrounded with walls, in which, in their season, are produced apples, pears, prunes, delicious cherries, nuts, almonds, olives, lemons, oranges, pomegranates, figs, grapes, and many other fruits, peculiar to the country, not known in Europe. All these fruits are very odoriferous, as I have myself experienced.—*Feuillé*, vol. ii.

and the flavour excellent. Among them the musk melon and the *scritti*, two marked and constant varieties, are preferred to any other; and I have seen many that were two feet in length. The melons begin to ripen in the month of December, and continue until the end of May. These last, which I have called winter melons (invernizi) are green, and will keep perfectly well during the winter if they are placed in a situation where the air may have free access to them.

The inhabitants cultivate seven species of water melons of an excellent kind, but the most esteemed is that called *pellata*, which has a thin rind like the skin of an apple. This fruit is a native of Jamaica, from whence the Spaniards imported it into Europe, but it is probable that the *cuchugna*, which is of the same species of an excellent flavour, was cultivated in Chili long before the arrival of the Spaniards.

I have already spoken of the great fertility of the soil in the production of different kinds of grain; and shall merely observe in this place that the species of wheat most generally cultivated is one without beard, called *mutica*; this is sowed in August, and the crop reaped in December. Hemp and flax grow extremely well in Chili; but as the exportation of it is rigorously prohibited, the inhabitants raise no more than is wanted for internal consumption.

The vine produces wonderfully, and the soil appears to be peculiarly favourable to it, as the thickets are filled with wild vines (the seeds having been carried thither by birds) from whose grapes the country people obtain a very good wine; but the cultivated vines produce delicious grapes of the best quality. From the borders of Peru to the river of Maúle, the mode of cultivating the vines is by raising the sets to the height of three or four feet by means of props or forked stakes which support them; but beyond that river they are planted upon the declivities of hills, and reclined on the ground. The grapes in the highest estimation are those that grow upon the shores of the Itata. The wine obtained from them is the best in Chili; it is called Conception wine, and is usually red, of a good body, an excellent flavour, and not inferior to the first wines in Europe.* A great quantity of this wine is annually exported to Peru, but it loses much of its pleasant flavour from being put into casks that are daubed over on the inside with a kind of mineral pitch.

* The country is full of hills, with fine vineyards on their tops, which produce very excellent wines.—*Feuillé*, vol. ii.

The wines of St. Jago are of several kinds, and although inferior to those of Conception, are very well tasted, and of a good body.—*American Gazetteer*; article CHILI.

That wine which is exported from Chili to Paraguay, is red, thick, and sweet, but has a certain harshness.—*E. E. Dobrizhoffer, T. 2. p. 229.*

The muscadel wine is, acording to Ulloa, of as good a quality as the best of Spain.* These wines are in general very strong, and great quantities are used for distilling brandy. The vintage takes place in the months of April and May. About twenty years since some vines of a black muscadel grape, of an excellent quality, were discovered in the valleys of the Andes, and from thence transplanted into the other provinces. As these valleys had never been inhabited, and until that time no such grape had been known in any other part of the country, it is difficult to determine whether it is a native of Chili or brought from Europe. It has besides some peculiarities that distinguish it, as the leaves being more indented, and the clusters perfectly conical, while the grapes grow so close to each other as to render it impossible to detach one without crushing several.

All the European fruit trees yield abundantly, and their fruit is as fine in Chili as in their native country.† The greater part are also remarkable

* Chili has in no less abundance grapes of various kinds, and among them those which produce a wine more highly valued in Peru than any other; it is mostly red, and a muscadel is also made, which in its smell and the deliciousness of its taste surpasses any kind known in Spain.—*Ulloa's Voyage.*

† The plain of Quillota is very pleasant. We were there at the time of the carnival, which occurs in that country in the beginning of autumn, and were much surprised to see a great

for their numbers and the increase of their size. In the southern provinces are forests of apple and quince trees from three to four leagues in extent, from whence proceeds that great variety of apples, the fruit of many of which is excellent. Among these, however, those of Quillota are the most in estimation. The quinces are remarkable for their size and goodness;* like those of Europe they have an acid and astringent taste, but if suffered to attain perfect maturity, and not gathered until the end of autumn, they are very sweet, and are called in the country *corcia*.

quantity of all kinds of the best European fruit trees which have been transplanted thither. They all produced in abundance, particularly the peaches, of which there were large thickets; while the only attention paid to their cultivation was by introducing some small streams of water among them, from the river Chile, to supply the want of rain during the summer. —*Frazier's Voyage*, vol. i.

Pears and apples grow so naturally in the bushes, that it is difficult to conceive, on seeing such quantities of them, how it is possible for these trees to have multiplied since the conquest to such a degree, if it is true, as is said, that they were not in the country before that period.—*Frazier's Voyage*, vol. i.

From these wild apples the Indians made a kind of cider for present use, not knowing how to ferment it so as to make it keep.—*E. E.—Falkner.*

* What I most admired was the size of the quinces, for they are larger than a man's head. But what was no less an object of surprise, was the little account made of them by the inhabitants, who suffered them to rot upon the ground without paying any attention to collecting them.—*Feuillé*, vol. iii.

It is a well known fact that this fruit loses its astringency by being allowed to remain a long time upon the tree; but in this country they pretend that the autumnal rains and the slight white frosts of that season are necessary to perfect it. There is likewise a particular species of the quince, improperly called *lucuma*. The fruit is very different from that of the real lucuma, and is always sweet, of a conical shape, and in a small degree umbilical; the skin, as well as the pulp, is of an orange colour, and the tree is a real quince tree.

The peaches amount to fourteen species, and frequently produce fruit of more than sixteen ounces weight. Among the *duracines*, that kind called in the country *alberchigos*, is the most in estimation; the fruit is large and very excellent, the pulp is of a reddish white, and the stone perfectly red. The tree, like the fig, bears twice a year; in the month of January it yields large and pulpy peaches, and in April a small fruit, resembling the almond, of a delicious taste, called *almendruchos*. The pears and cherries produce also twice a year, but the latter growth rarely obtains perfect maturity.* Oranges, le-

* The fruit trees brought from Europe thrive very well in that country, whose climate is so favourable as respects vegetation that the trees bear fruit there the whole year. I have frequently seen in the same orchard, what is common in orangeries, the fruit in all states, in the bud, in flower, green, and perfectly ripe at the same time.—*Frazier's Voyage*, vol. i,

mons, and citrons, of which there are many varieties in Chili, grow every where in the open fields, and their vegetation is not inferior to that of the other trees. Besides the common kind, a species of small lemon is much cultivated, the fruit of which is about the size of a walnut, and very juicy. The leaves are small and resemble those of the orange more than the lemon, a very delicious sweetmeat is made from t e fruit, and the juice is much used in inflammatory fevers.

The olive* grows very well, particularly in the vicinity of St. Jago, where I have seen trees of three feet in diameter and of a proportional height. Medlars, service apples, the three-grained medlar and the jujube, are the only European fruits at present unknown in Chili.

* The first olive was carried from Andalusia to Peru in 1560, by Antonio de Ribera, of Lima.—*E. E.*

P. Manuel Rodriguez. Ind. Chron.

CHAP. IV.

Worms, Insects, Reptiles, Fishes, Birds, and Quadrupeds.

CHILI is not quite so abundant in animals as the other countries of America. The reptiles, for instance, are but few, and the indigenous quadrupeds do not exceed thirty-six species. The classes of worms, of fishes, and of birds are those that contain the greatest number of species and of individuals. From my observations, however, I am led to believe that insects are less abundant than in Italy, and that Chili produces a greater number of worms, particularly the marine kind; the whole coast of the Pacific Ocean being filled with zoophytes and molluscas, many of which are wholly unknown to naturalists.

SECT. I. *Molluscas.*—The *pyura* (pyura, gen. nov.) is a mollusca, remarkable for its shape and its mode of dwelling. This animal, which scarcely merits the name, is about an inch

in diameter, and of the shape of a pear, or it may more properly be compared to a small fleshy purse, of nearly a conical form, filled with salt water; it is of a red colour, and is furnished on the upper part with two very short trunks, one of which serves for a mouth, the other as an anus. Between these are two shining black points which I suppose are the eyes. On the strictest examination I have not been able to discover any organs or intestines separate from the flesh composing the body of this animal, which is smooth on the outside, and within mammiform. It is not, however, destitute of sensibility, as, on being touched or drawn from its cell, it ejects with violence from both trunks the water which it contains. Several of these animals live together in a kind of coriaceous hive; this is of a different form in different places, and appears to be completely closed on the outside, but within is divided into ten or more cells by means of strong membranes. Each individual has his separate cell, where he lives a recluse life without any visible communication with his companions, and in which he is compelled to remain, though there is no perceptible ligament that attaches him to it. From this circumstance it may fairly be presumed that these animals are hermaphrodites of the first species, or such as produce their like without coupling.

The hives, which serve as habitations for

these molluscas, resemble *alcyoniums*, and are attached to rocks, covered by the water, from whence they are torn by the waves and driven on the shore. The inhabitants of Chili eat the pyures, either boiled or roasted in the shells, and when fresh they have the taste of a lobster. Great quantities of them are dried annually and sent to Cujo, where they are in great request. I believe the animal which Kolben, in his description of the Cape of Good Hope, calls the sea fountain, is of the same family.

Various species of the holothuria, especially the *holothuria physalis*, or the galley, are frequently found upon the shore, whither they are driven by the waves. This mollusca, called by several authors the sea nettle, from its producing an inflammation of the skin when touched, is of the shape and size of an ox-bladder filled with air. It is furnished within with a great number of branching feelers, or tentaculæ, intertwined with each other, in the centre of which is placed the mouth, of a very deformed appearance.

These tentaculæ are of several colours, red, purple or blue; the skin that forms the vesicle or bladder is transparent, and appears to consist of different longitudinal and transverse fibres, within which a peristaltic motion is perceptible. The top of this bladder is ornamented with a membrane in the shape of a crest, which serves the animal as a sail, and contains nothing excepting

a little clear water, confined to one of its extremities by a membrane or diaphragm, which prevents it from spreading throughout the whole cavity of the bladder.

Besides the common cuttle fish (sepia octopodia) three other singular species are found in the sea of Chili. The first, the ungulated cuttle fish (sepia unguiculata) is of a great size, and instead of suckers, has paws armed with a double row of pointed nails, like those of a cat, which it can, at its pleasure, draw into a kind of sheath. This fish is of a delicate taste, but is not very common. The second I have called the tunicated cuttle fish (sepia tunicata) from its body being covered with a second skin, in the form of a tunic; this is transparent, and terminates in two little semicircular appendages like wings, which project from either side of the tail. Many wonderful and incredible stories are told by sailors of the bulk and strength of this fish, but it is certain that it is frequently caught of one hundred and fifty pounds weight on the coast of Chili, and the flesh is esteemed a great delicacy. The third is the cuttle fish with six feet (sepia hexapodia). This species is of a very singular figure, and when seen in a state of quiescence, appears much more like a broken piece of the small branch of a tree than an animal. Its body does not exceed six inches in length, and is of the size of a man's finger, divided into four or

five articulations decreasing in size towards the tail. Its feet are usually drawn up near the head, but when extended have the appearance of so many floating roots; like those of other cuttle fish, they are furnished with suckers, but so small as to be scarcely discernible. The head is misshapen, and supplied with two antennae, or trunks. The black liquor is contained in a little bladder or vesicle, common to all the genus, and is very good for writing. The animal, when taken in the naked hand, produces a slight degree of numbness, which is not, however, attended with any disagreeable consequences.

Of the urchins, or sea-eggs, there are several species, but the principal are the white and the black. The white urchin (echinus albus) is of a globular form, and about three inches in diameter; the shell and spines are white, but the interior substance is yellowish, and of an excellent taste. The black urchin (echinus niger) is a little larger than the white, and of an oval form; the exterior and the eggs are black; it is called the devil's hedge-hog, and is never eaten.

Of the class of vermes, or worms, the order of testacei are most abundant in Chili; the sea shore being covered with all kinds of shells, of which several hills are formed, from whence the inhabitants collect great quantities for lime. I have no doubt that among them might be dis-

covered not only some of a new species, but of a new genus; but as the limits of my work will not permit me to go into a full description of them, I shall confine myself to those kinds that are the most esteemed and made use of by the inhabitants.

Oysters are found in many places on the coast; there are several varieties, but the largest and best are taken near Coquimbo. Escallops are found in the same places with the oyster, not only those with convex, but those with flat shells.

The principal species of the muscle are the common, the pearly muscle (mytilus margaritifer) the large and small Magellanic muscle, the chorus, and the black muscle. The large Magellanic muscle is six inches long and three broad, the shell is covered on the outside with a brownish skin, beneath which it is of a beautiful sky blue, crossed transversely with purple stripes, and within is of a rich mother of pearl colour striped with red. The little Magellanic muscle is nearly of the same colour, but of rather a more oval form. Both these kinds commonly contain some small pearls, of little lustre; those, on the contrary, that are found in the pearly muscle, are of a fine water, but almost always very small.

The chorus (mytilus chorus) is seven inches long by three and a half broad. The skin is of

a deep blue, but the shell, when stripped of it, is of a shining white inclining to blue; the muscle itself is very white and excellently tasted. It is principally found on the island of Quiriquina, and the coast of Araucania. The black muscle (mytilus ater) is nearly as large as the chorus, the shell is rough and of a dark blue, and the flesh black and never eaten.

Fresh water muscles are also found in abundance in the rivers and the ponds. I have noticed three species of them, known by the names of *dollum*, *pellu*, and *uthif*, but they are all of an insipid and disagreeable taste.

The tellinae are also common in Chili, particularly the *mayco*, a species of rayed tellens, or sun-beam, and the *chalgua*, which is entirely white.

The *thaca* (chama thaca) is a cockle that is nearly round, about four inches in diameter; the shell is striated longitudinally, and spotted on the outside with white, yellow, and purple; the inner part is of a beautiful yellow, and the flesh excellent eating. The *macha* (solen macha) is a species of razor-shell, a genus of shell-fish so called from their form. It is six or seven inches long, and variegated with sky-blue and brown. Both these kinds bury themselves in the sand, from whence the fishermen take them in great numbers.

The rocks of Chiloé afford a residence to a

species of pholades (pholus Chilensis) which the inhabitants call *comes*. The shell is bivalve, but has some cretaceous appendages on the upper part, and is often six inches long and two broad.

Barnacles of various species are found in abundance upon all the coast. Of these, one called the *parrot-bill* (lepas psittacus) is much esteemed by the inhabitants. From ten to twenty of these animals inhabit as many small separate cells, formed in a pyramid of a cretaceous substance. These pyramids are usually attached to the steepest parts of rocks, at the water's edge, and the animal derives its subsistence from the sea by means of a little hole at the top of each cell. The shell consists of six valves, two large and four small; the large ones project externally in the form of a parrot's bill, from whence the animal has received its name. When detached from the rocks they are kept alive in their cells for four or five days, during which time they occasionally protrude their bills as if to breathe. They are of different sizes, though the largest do not exceed an inch in length, and are very white, tender, and excellent eating.

Of the buccinum and the murex there are likewise a great number of species. One of the latter, the *loco* (murex loco) is highly esteemed. It is very white, and of a delicious taste, but rather tough, and in order to render it tender, it

is generally beaten with a small stick before it is cooked. The shell is oval, and covered with knots or tuberosities; the animal is about four or five inches in length, and near the neck has a small vesicle which contains a few drops of a purple liquor.

As far as I have had it in my power to observe, there are no naked snails or slugs in Chili, but those that are covered with a shell are very numerous in all the thickets. One of the most curious species is found in the vicinity of Conception; I have called it the *serpentine*, from its skin being hard and covered with scales like that of a serpent. The shell is conical, and larger than a turkey's egg; it is slightly striated, and of a whitish grey colour, and the edge of the aperture is turned back and forms a border of a beautiful red.

Sect. II. *Crustaceous Fishes and Insects.*—Thirteen different species of crabs and craw-fish have been discovered on the sea-coast of Chili, and there are four kinds inhabiting the fresh waters. Among the crabs the most remarkable are the *talicuna*, the *xaiva*, the *apancora*, the *hairy*, the *santolla*, and the *crowned*.

The *talicuna* (cancer talicuna) has a round, smooth, and convex shell, about four inches in diameter. The claws are denticulated, the head and the eyes very protrusive, and the belly is al-

most entirely covered with the tail. When alive it is of a dark brown, but becomes red when boiled.

The *xaiva* (cancer xaiva) has a shell that is nearly spherical, about two inches and a half in diameter, furnished with spines upon the edges.

The *apancora* (cancer apancora) is larger than the talicuna. The shell is oval and wholly denticulated, the claws are hairy, and the tail of a triangular form and very long.

The *hairy crab* (cancer setosus) is of the size of the preceding, and is entirely clothed with rough hair like bristles; the back shell is in the shape of a heart, and covered with protuberances. The beak is divided and reverted, and furnished with a great number of hairs.

The *santolla* (cancer santolla) surpasses all the others in its size, and the delicacy of its taste. Its shell is orbicular, convex, and of a coriaceous consistence; it is covered with large spines, which are easily detached when it is roasted, and the claws are very long and large, and covered with a wrinkled skin.

The *crowned crab* (cancer coronatus) is furnished with a shell nearly oval, of about four inches and a half in diameter, with an excrescence in the centre representing a mural crown.

Crawfish are no less abundant on the Chilian coast. Lord Anson mentions having caught them at Juan Fernandez of eight and nine pounds

weight, that were of an excellent flavour. Lobsters are also found in such quantities on the same island, that the fishermen have no other trouble to take them, than to strew a little meat upon the shore, and when they come to devour this bait, as they do in immense numbers, to turn them on their backs with a stick. By this simple method many thousands are taken annually, and the tails, which are in high estimation, dried and sent to Chili.

Of the fresh water crabs, the most remarkable is that called the *mason* (cancer cementarius). It is about eight inches long, of a brown colour striped with red; the flesh is very white, and preferable to that of any other species of river or sea crab. They are found in abundance in almost all the rivers and brooks, on whose shores they build themselves, with clay, a small cylindrical tenement, which rises six inches above the surface of the ground, but admits the water, by means of a subterranean canal extending to the bed of the river. They are readily caught by letting down a basket or osier pot, with a piece of meat in it, into the water.

The insects which I have noticed in Chili were in general like those of Italy; a great number, however, appear to be very distinct, and to merit a particular description. Among the latter is a singular species of the *chrysomela* (chrysomela maulica) which is found upon the flowers

of the *visnega*. It is of an oval figure, a little larger than a house-fly, and is entirely of a golden colour, and extremely brilliant. The country people in the province of Maúle, where it is principally to be met with, string together a number of these insects for necklaces and other ornaments, which preserve their beauty and brilliancy for a long time.

In the same province is found a black beetle of more than half an inch in length, called *pilmo* (lucanus pilmus) which is very destructive to leguminous plants, particularly the bean. But the husbandmen have succeeded in nearly extirpating this species, by shaking the plants, upon which they are, over vessels of hot water placed beneath.

Chili is much less infested with grasshoppers than Cujo, and many other countries in America. There is but one species with which I am acquainted; it is found upon fruit trees, and is about six inches long. When the insect extends its legs, it resembles very much a twig of the tree upon which it keeps. The common people, according to the vulgar notion that every thing deformed has some connexion with evil spirits, call it the devil's horse.* It is not a common insect, and appears to me to resemble the *grillus elephas*

* From the author's description, this insect appears rather to belong to the genus of mantis than any other.—*Fr. Trans.*

of Linnæus. Bed-bugs were unknown in Chili till within the last sixty years. They are said to have been first introduced by the European ships, but have since increased very much in the northern provinces, particularly in St. Jago. The southern provinces are as yet exempt from this troublesome insect.

The glow-worms that I have seen were in general similar to those of Italy. But one night, as I was passing a little wood, I observed three insects as large as the *death's head sphinx* (sphinx atropos) which gave a very bright light. My attempts to take them, however, were fruitless, and I was never afterwards able to discover any of them, but I am of opinion that they were a species of the lantern-fly.

Of caterpillars there is a great variety of species; and in the summer the fields of Chili are embellished with the most beautiful butterflies. Among them are some that are remarkable for their size and the splendour of their colours. Of these, the most distinguished is one that I have denominated the *parrot butterfly* (papilio psittacus). This is very large and wonderfully beautiful; the top of the head is of a fine vermilion, marked with yellow; the back yellow, with red, azure, and green spots; the upper part of the wings is green, spotted with yellow and blue, and the lower of a pale red; the belly is blue, speckled with brown and grey, and the antennae,

which are shaped like a club, are purple. There is another of the same size (papilio leucothea) called by the children *palama*. This butterfly is entirely of a silvery white, except the antennae and legs, which are black.

In the vicinity of the sea, between the rivers Rapel and Metaquito, is a kind of caterpillar said to resemble the silk-worm, which forms upon the forest trees small cocoons of a beautiful silk, not inferior to the European. Nor can it be doubted, that a climate so mild as that of Chili should be peculiarly favourable to the propagation of the silk-worm, but as yet no attention has been paid thereto, and all the silk used in that country is imported from Europe.

It would not readily be believed that the rosin, which is collected in such quantities in the province of Coquimbo, from a shrub called *chilca*, a species of origanum, is not a real gum, and, like others, an exudation of the sap through the bark. But one of my countrymen, the Abbé Panda, who has examined with much attention the natural productions of that province, has lately discovered that this supposed rosin is produced by a small smooth caterpillar, of a red colour, and about half an inch in length.* These

* I am convinced that this resinous substance is a production of the tree itself, and that the caterpillar merely facilitates its exudation, by biting the buds in the spring; the same circumstance occurs in many of the resinous trees of Europe. —*Fr. Trans.*

insects collect in great numbers in the beginning of the spring on the branches of the *chilca,* where they form their cells of a kind of soft white wax. In these they become changed into a small yellowish moth, with black stripes upon the wings, which I have named *phalena ceraria.* The wax is at first very white, by degrees becomes yellow, and finally brown; this change, and the bitter taste which it then acquires, is supposed to be owing to the fogs, which are very frequent in the provinces where it is found. It is collected in autumn by the inhabitants, who boil it in water, and afterwards make it up into little cakes, in which form it is brought to market. In order to increase its weight, many are accustomed to mix it with the rosin obtained from another resinous shrub called *pajaro pobo,* and in this state great quantities of it are sold to ship-masters, who use it for paying their vessels, the only purpose to which it has hitherto been applied. It is to be regretted that the situation of the Abbé would not permit him to pursue his experiments, in order to determine whether this rosin might not serve for candles equally as well as bees wax, which it greatly resembles.

Upon the branches of the wild rosemary is also found a whitish viscous substance, in globules of the size of a hazel-nut, containing a very limpid oil, which unquestionably proceeds from that shrub, and might be found useful for

many purposes. These glands serve at the same time for the habitation of a kind of caterpillar, which becomes transformed into a small fly with four brown wings, of the genus of cynips.

In Chili there are many species of the bee, particularly in the southern provinces, where those that produce honey make their hives in hollow trees, or in holes in the earth; all the wax used in the Archipelago of Chiloé is the product of these wild bees.

As far as I have been able to ascertain, none of the common wasps are to be found in Chili; and as to musquitoes, gnats, and other species of stinging flies, so troublesome to the inhabitants of warm countries, they are entirely unknown there. In the vicinity of stagnant waters only have I observed a gnat of the species denominated by Linnæus, culex ciliaris.

Of the water-fly, there are several species; they are always met with in the neighbourhood of dwellings, and differ in no respect from those of Europe, excepting one of a middle size, found only in the province of Calchagua. This is remarkable for its pleasant musky smell, and is used by the inhabitants to perfume their clothes, from which circumstance I have named it tipula moschifera.

As to the ants, they appear to me to be of the same kind with those of Europe, and not to offer any discriminative mark of character.

The *Chigua* (pulex penetrans) called by the Chilians *nigua* or *pequi*, is found only in the environs of the city of Coquimbo, and so rarely is it met with even there, that I have been assured by a person who resided there many years, that a single child was the only instance he had heard of any one's having been incommoded by this insect. Nigua is a generic term in Chilian, signifying all kinds of vermin or animalculæ which infest animals, particularly the feathered tribe; these are precisely similar to those of Europe. Ulloa appears, therefore, to have been ignorant of the extensive signification of this word in Chilian, as what he says in his voyage, that the chiguas, or pricker, is found upon the whole coast of Chili, is contradicted by universal experience.

Of the spiders there is but one species that is remarkable; this is the great spider with fangs, which I have called *aranea scrofa*. It is found in the vicinity of St. Jago, and lives under ground; the body is as large as a hen's egg, and covered with soft brown hair, and the claws very long and large; in the middle of its forehead are four large eyes, disposed in the form of a square, and at the sides of the head two others that are less, and the mouth is furnished with two pincers of a shining black, about two lines in length, turned back towards the forehead. Notwithstanding its formidable appearance, this spider is not dangerous, and serves as an amusement for

children, who pluck out its pincers without apprehension, which are by the common people believed to be a specific for the tooth-ache.

Scorpions, called in the language of the country *thehuanque* (scorpio Chilensis) differ but little or nothing in size or appearance from those of Europe. They are usually met with in some of the secondary mountains of the Andes. The common colour is a dark brown, but those found under stones upon the shores of the river Coquimbo are yellow.* It is said that neither of them are venomous, and that those who are bitten by them experience no inconvenience. I was once present when a young man was bit by one of them, who merely complained of a slight smarting of the part, which continued inflamed for not more than half an hour. Such experiments, however, are too superficial to prove satisfactory.

Sect. III. *Reptiles.*—I have already observed, that there are but few reptiles in Chili; and, in truth, all that are known are water turtles, two species of frogs, the land and water toad, a few lizards of the aquatic and terrestrial kinds, and one species of serpent; nor are either of these venomous.

*The European scorpions are yellow when young, and continue so while they remain under stones, but on exposure to the air become brown.—*Fr. Trans.*

The turtles are of two species; one is an inhabitant of the sea, denominated by Linnæus testudo coriacea; the other, testudo lutaria, is found in fresh water, particularly in the lakes of the southern provinces.

The frogs are the green frog (rana esculenta) and the temporary frog (rana temporaria).

The land toads are similar to those of Italy, and live altogether in moist and wet places. The water toads are of two kinds, the arunco (rana arunco) and the thaul (rana lutea). The *arunco* is a little larger than the temporary frog, and nearly of the same colour. The body is tuberculated, and the feet webbed; the fore feet have four toes and the hinder five, all furnished with small nails almost imperceptible. It is called by the Araucanians *genco,* which signifies lord of the water, as they believe that it watches over the preservation and contributes to the salubrity of the waters. The *thaul* is less than the common or green frog which it resembles in its form. Its skin is yellow and covered with tubercles, and its feet are shaped like those of the arunco, but not palmated.

The most remarkable of the terrestrial lizards is the *pallum* (lacerta pallum) of whose skins the peasants make their purses. This lizard lives usually under ground in the plains; its length, exclusive of the tail, is a little more than eleven inches, and it is three inches in circumference;

the tail is as long as the body, the head triangular, covered with small square scales, the nose very long, the ears round and like those of all lizards, placed at the hinder part of the head. The upper part of its body is covered with small rhomboidal scales, green, yellow, black, and blue; the skin of the belly is smooth and of a yellowish green; the feet have each five toes, furnished with strong nails, and the tail is round and of the same colour as the body.

Of the aquatic lizard but one species has been discovered, to which Feuillé, who saw it, has given the name of the water salamander (salamandra aquatica nigra). It is fourteen inches and a half in length, including the tail; the skin is without scales, rough in a slight degree, and of a black inclining to blue; the head is elevated and rather long, the eyes large and yellow with a blue pupil, and the nostrils open with a fleshy border; its nose is pointed, the mouth wide and furnished with two rows of small crooked teeth; the tongue is large, of a bright red, and attached at the base to the gullet, in which is a large crop that the animal can contract and expand at pleasure; like other water lizards it is without ears, and from the top of its head to the extremity of its tail, extends a kind of indented crest. The fore feet are much shorter than the hind, they have each five toes, which, instead of nails, are furnished with round cartilages; the

tail is straight and rounded at the base, but towards the end becomes flattened and expanded like a spatula; it is about two inches in breadth, and the edges are notched like a saw.

The only serpent of Chili is that known to naturalists by the name of coluber esculapii. It is striped with black, yellow, and white, sometimes mingled with brown. The largest that I have seen was not more than three feet in length; it is perfectly harmless, and the peasants handle it without the least apprehension.

Sect. IV. *Fishes.*—The various kinds of esculent fish, found on the coast of Chili, are by the fishermen computed to be seventy-six, the most of which differ from those of the northern hemisphere, and appear to be peculiar to that sea. There are many, however, that are merely varieties of species that are common to almost all seas. Such, among the amphibious or cartilaginous fishes, are the ray, the torpedo, scate, dog-fish, saw-fish, fishing-frog, and old-wife; and among the spinous fishes, the electrical eel, the conger, the sword-fish, the cod, the whiting, the sole, the turbot, the dorado, the bonito, the tunny, the mackarel, the roach, the barbel, the mullet, the shad, the pilchard, the anchovy, and several others.

Whether the vast numbers of fish on the coast of Chili, are owing to some peculiar local causes,

or to the small number of fishermen, it is a fact, supported by the testimony of the best informed navigators, that no country in the world furnishes a greater quantity of those that are excellent.*

The bays, harbours, and, in a particular manner, the mouths of the large rivers, swarm with them of all sizes, and in some places they are caught without any trouble. The river *Cauten*, which is three hundred toises broad at its mouth, and of sufficient depth to admit a ship of the line, is, at certain seasons of the year, so filled with fish, for seven leagues from its mouth, that

* In the road of Valparaiso is caught an abundance of excellent fish of all kinds, as king-fish, bream, soles, &c. besides an infinite number of those that are migratory, as pilchards, and a species of cod that come upon the coast in the months of October, November, and December; also shad, and a kind of anchovy, which at times are in such multitudes, that they are caught with baskets on the surface of the water.—*Frazier's Voyage*, vol. i.

We had also fish in such plenty, that one boat would, with hooks and lines, catch, in a few hours, as much as would serve a large ship's company two days; they were of various sorts, all excellent in their kind, and many of them weighed from twenty to thirty pounds.—*Hawkesworth's Voyage of Commodore Byron*, chap. viii.

This part of Masafuero is a very good place for refreshment, especially in the summer season; the goats have been mentioned already, and there is all round the island such plenty of fish, that a boat may, with three hooks and lines, catch as much as will serve an hundred people; among others we caught excellent soal fish, cavallies, cod, halibut, and crawfish, &c.—*Hawkesworth's Voyage of Capt. Carteret*, chap. ii.

the Indians flock thither in large companies, and take an astonishing quantity by striking them from the shores with their lances, formed of a reed, which I have already described, called *coliu;* and an equal abundance is to be found in the mouths of all the southern rivers.

In the Archipelago of Chiloé, where the fish are still more plentiful, the inhabitants place in the mouths of the rivers, and even in certain places on the sea shore, palisades, leaving an opening towards the sea, which, when the tide begins to ebb, they carefully close. On the retiring of the water, the fish enclosed in these wears are left upon the sand, and taken without difficulty. There is almost always a greater quantity enclosed than is wanted by the inhabitants, who come thither from all quarters to obtain a supply, so that they frequently open the gate, and permit the most part to escape with the returning flood.

The cod is as abundant upon the coast of Juan Fernandez as upon the banks of Newfoundland, and caught with equal facility, for no sooner is the line thrown in, than a fish is drawn up. These fish arrive in large shoals, in the months of November and December, upon the coast of Valparaiso. The inhabitants formerly paid no attention to this important fishery, but of late have pursued it with great success.

In some parts of the coast, great numbers of fish are occasionally found upon the shore.

These fish, when pursued by the whale, retire to the shallows, where, unable to contend against the violence of the waves, they are thrown upon the beach, and become the prey of birds, or when found alive by the inhabitants, are taken and salted for use. Of the fish, the most esteemed are the *robalo*, the *corvino*, the *lisa*, and the *king-fish*.

The *robalo* (esox Chilensis) is nearly of a cylindrical form, and from two to three feet long. It is clothed with angular scales, of a golden colour upon the back, and silver on the belly, the fins are soft and without spines, the tail is truncated, and the back marked longitudinally with a blue stripe, bordered with yellow. The flesh is very white, almost transparent, light, and of a delicious taste. Those taken upon the Araucanian coast are the most in repute, where they are sometimes caught of eight pounds weight. The Indians of Chiloé smoke them, after having cleaned and soaked them for twenty-four hours in sea water, and when sufficiently dried, pack them up in casks of one hundred each, which are generally sold from two to three dollars. The *robalo* prepared in this manner is superior to any other kind of dried fish.

The *corvino* (sparus Chilensis) is nearly of the same size as the preceding; it is sometimes, however, found of five or six feet in length. This fish has a small head, and a large oval body,

covered with broad rhomboidal scales, of a mother of pearl colour, marked with white; the tail is forked, and the body encircled obliquely from the shoulders to the belly with a number of brownish lines. The fins are armed with spiny rays, and the flesh is white, firm, and of a good taste, particularly when fried. It would probably be still better if it were prepared like that of the tunny.

The *lisa* (mugil Chilensis) in its form, scales, and taste, is much like the common mullet, but is distinguished by the dorsal fin, which in the *lisa* is entire. There are two species of this fish, the sea and the river, neither of which exceed a foot in length; the first is a very good fish, but the latter is so exquisite that it is preferred by many to the best of trout.

The *king-fish* (cyprinus regius) so called from the excellence of its flavour, is nearly of the size of a herring; it is of a cylindrical form, covered with golden scales upon the back, and with silver upon the sides. It has a short blunt mouth without teeth, yellow eyes, with purple irides and blue pupils; its fins are yellow and soft, and that of the back extends from the head to the tail, which is divided into two parts. These fish are caught in such abundance, that a hundred of them may be bought for a real.

Although the fresh waters do not afford as many different species of fish as the sea, the

number of individuals is much greater. The rivers, streams, lakes, and even the small brooks, produce a surprising quantity, especially those beyond the 34th degree of latitude. The kinds most in estimation are the *lisa*, which I have already noticed; the *trout*; the *cauqui* (cyprinus caucus); the *malche* (cyprinus malchus); the *yuli* (cyprinus julus); the *cumarca*, or peladial (stromateus cumarca); and the *bagre*, or luvur (silurus Chilensis). The bagre has a smooth skin without scales, and is brown upon the sides, and whitish under the belly. In its form it resembles a tad-pole, the head being of a size disproportionate to the length of the body, which does not exceed eleven inches at the most. It has a blunt mouth, furnished like that of the barbel, with barbs. It has a sharp spine on the back fin, like the tropical bagre, but its puncture is not venomous, as that is said to be. The flesh is yellow, and the most delicious of any esculent fish that is known. There is said to be another species or variety of this fish, inhabiting the sea, that is black, and which I presume is the same that Commodore Anson's sailors called, from its colour, the chimney-sweep.

Eels are found only in the Araucanian provinces, where they are exceedingly plenty, and are taken by the Indians in a kind of basket, placed against the current. The river Talten, which waters those provinces, produces a small

fish called *paye*, which, as I have been assured by those who have seen them, is so diaphanous, that if several are placed upon each other, any object beneath them may be distinctly seen. If this property is not greatly exaggerated, this fish might serve to discover the secret process of digestion, and the motion of the fluids.

Among the great varieties of fish with which the waters of Chili abound, the three following are more particularly deserving of notice. These inhabit the sea, and are the *gilt chætodon*, the *cock-fish*, and the *tollo*.

The *gilt chætodon* (chætodon aureus) is flat, of an oval form, about a foot in length, and covered with very small scales. It is of a bright gold colour, and marked with five distinct bands, of more than half an inch in width, some grey, and others black. The first is black, commences at the back of the neck, and passes in a circular direction through the eyes; the two in the centre are grey, and encircle the body, and the two last are black and grey, and surround the root of the tail, which is of a silver colour. This beautiful fish has a small head, an elongated mouth, furnished with small teeth, and the back entirely covered from the head to the tail with a large spinous yellow fin. The tail is in the form of a fan, and is bordered with yellow, and the flesh is excellent eating.

The *cock-fish*, (chimæra callorynchus) placed

by Linnæus among the amphibious swimmers, is about three feet long. Its body is round, larger towards the middle than the extremities, and covered with a whitish skin devoid of scales. Its head is surmounted with a cartilaginous crest extending five or six lines beyond the upper lip, from whence it has obtained the name of the cock-fish, or *chalgua achagual* in the Araucanian language. It has five fins; the dorsal commences immediately behind the head, and extends itself to the middle of the back, it is very large, of a triangular form, supported by a strong sharp spine, five inches in length; this spine, which is longer than the fin, is the only bony part of the fish, all the rest being cartilaginous, even the back bone, which, like that of the lamprey, is furnished with neither marrow nor nerves. The four other fins are placed near the gills and beneath the anus; these are double, which is very uncommon, and the tail is shaped like a leaf, with the point turned towards the belly. This fish, when eaten, is served up more as an object of curiosity than from a regard for its flavour, which is very indifferent.

The *tollo* (squalus Fernandinus) is a species of dog-fish, a little larger than the cock-fish, and remarkable for two dorsal spines, like those of the squalus acanthias. These spines are triangular, bent at the point, as hard as ivory, and two inches and a half long, and five lines broad.

They are said to be an efficacious remedy for the tooth-ache, by holding the point of one of them to the affected tooth.

Notwithstanding the whale belongs to the class of lactiferous animals, I have thought proper to notice it in this place, as many authors, from its external conformation, have ranked it among fishes. The species that frequent the Chilian seas are the great whale (balaena mysticetus) called by the Araucanians *yene*; the little whale (balaena boops) called *icol*, and the three known species of the dolphin. Both these kinds of whale are very common in that sea, and at certain seasons they are seen in great numbers, particularly near the mouths of rivers, whither they come in quest of fish.

The late English navigators speak of the great quantity of whales which they met with upon the coast of Terra del Fuego, and in the Straits of Magellan; and in the account of Captain Cook's last voyage, the little whale is particularly mentioned. I have good reason to believe that, besides the two kinds of whales above mentioned, all the species discovered in the northern may likewise be found in the southern seas; but as the Chilians have never paid attention to the whale fishery, I am not able to assert it with positiveness, nor to determine the difference, if there be any, between the northern and southern whale; this, however, is certain, that the whales of the

south are not inferior in size to those of the north. I have myself seen a whale that had been driven ashore on the coast of the Chones, that was ninety-six feet long, and on the same coast was also found the rib of another twenty-two feet in length. I cannot but be surprised that Mr. Buffon, in contradiction to the testimony of the most respectable navigators, has asserted that the southern seas produce no whales,* and that the largest animal that is found in them is the manati; that learned naturalist, who too frequently suffers himself to be misled by his favourite system, should have recollected that the great phoca, improperly denominated the sea-lion, an animal which he has himself described, far exceeds in size the manati.

There are occasionally seen upon the coast of Araucania, certain animals called by the Indians sea-cows. From the imperfect description which I have received of them, I cannot determine whether they are manatis, morses, or a species of phocæ. I am, however, more inclined to believe them to be manatis, as great numbers of these animals were found by the first Spanish settlers of Juan Fernandez on the shores of that

* On the 30th we steered for Staten-land, and on the passage fell in with so great a number of whales, of the largest size, that the crew were apprehensive lest they would sink the ship. We also saw great numbers of sea-wolves and penguins.—*Journal of Captain Cook's second Voyage, p.* 522.

island; but the immense destruction which they made of them, as they were eagerly hunted for their flesh, has entirely driven them from those shores.

The Indians pretend that in certain lakes in Chili is to be found an animal of a monstrous size, which they call *guruvilu*, or the fox-serpent. They believe that it devours men, and on that account never bathe in those lakes. But the descriptions which they give of its size and form scarcely ever agree: some representing it as having the body of a serpent with the head of a fox; others, as being of a circular form, and resembling an inflated ox-hide. It is, however, probable that this animal has no other existence than in the imaginations of these people.*

Sect. V. *Birds.*—After that of insects, the most numerous class of animals in Chili is that of birds. Those that inhabit the land alone amount to a hundred and thirty-five species, and

* Of the various means of defence with which Nature has provided its creatures, I remember none more singular than that of the drum-fish on the coast of Peru; which, when alarmed, inflates itself till it becomes perfectly round. The eyes project so far when it is in this state, as to prove that it is not done without great effort. But none of its enemies can then swallow it because of its size, or bite it because of its shape.—*E. E.*

Mercurio Peruano, No. 286.

the number of those belonging to the sea, is almost impossible to be estimated. The genus of gulls alone is known to contain twenty-six different species, and many others are not less numerous.

That vast chain of mountains, the Andes, may be considered as the nursery of birds of all kinds. They assemble there in great numbers in the spring, in order to breed and rear their young in greater security; and on the falling of the first snows in winter, they quit them in large flocks, and seek the plains and the maritime mountains. To their residence in the Andes, which are almost always covered with snow, I think may be attributed that difference of plumage frequently observable in individuals of many of these species, of which I have seen some that were perfectly white.

Many of the birds of Chili are merely simple varieties of species that are found in Italy and many other parts of Europe. Of this number are the geese, ducks, divers, plovers, herons, kites, falcons, black-birds, pigeons, crows, partridges, and domestic fowls.* The sportsmen

* The country abounds with an infinity of birds, particularly wild pigeons, turtle-doves, and partridges, though the latter are inferior to those of Europe, and with grouse and ducks of all kinds; among the latter is one called the *royal duck*, which has a red comb upon its head. There are likewise curlews, and a kind of widgeon, (resembling the sea-bird called *malvis*)

enumerate sixteen species of wild ducks, and six of geese. Among the former, the *royal duck* (anas regia) is principally distinguishable; it is much larger than the common duck, the upper part of the body is of a beautiful blue, and the lower part grey; the head is adorned with a large red comb, and the neck with a collar of beautiful white feathers.

Of the geese, the most remarkable is the *coscoroba*, (anas coscoroba). It is highly esteemed both for its size, and for the ease with which it is tamed, as it becomes strongly attached to those who feed it, and follows them around like a dog. The plumage is entirely white, the feet and bill are red, and the eyes of a fine black.

The swan of Chili (anas melancoripha) is nearly of the same size with that of Europe; its form is likewise similar, but its plumage is different, that on the head and upper part of the neck being black, and the residue of a snowy white. The female has six young at a brood, which she is careful never to quit, but takes them

which has a long, straight, narrow, scarlet bill, flat upon the upper side, and a stripe of the same colour over the eyes; the feet are like those of the ostrich, and the flesh is very good eating. Parrots are in plenty, and there are some swans and flamingoes, whose feathers are highly prized by the Indians for ornamenting their heads upon public occasions; these are of a beautiful white and carnation, colours that are in the greatest estimation among them.—*Frazier's Voyage*, vol. i.

with her upon her back whenever she leaves her nest.

Of herons there are five very beautiful species. The first is the large European heron (ardea major). The second, the red-headed heron, (ardea erytrocephala) is of the size of the first; it is entirely white excepting the head, which is crowned with a long red crest that hangs down upon its back. The third, the galatea heron (ardea galatea) is of a milk-white colour, the neck is two feet and a half long, the legs are of the same length and red, and the bill, which is yellow, is four inches long. The fourth, the heron with a blue head (ardea cyanocephala). The head and back of this species are blue, the wings black, edged with white, the belly is of a yellowish green, the tail green, the bill black, and the legs are yellow. The fifth is the thula (ardea thula) a name derived from the Chilian; it is entirely white, and its head is adorned with a beautiful crest of the same colour.

Of the two kinds of eagles in Chili, one is the yellow eagle of Europe, called by the Indians gnanca, and another species called calquin, which appears to me to differ but little from the *itzquauhtli* of Mexico, and the *urutaurana* of Brasil. This eagle, from the extremities of its wings, measures about ten and a half feet; its breast is white, spotted with brown, and the neck, back, and wings, are black, inclining to blue; the tail

is marked transversely with black and brown stripes, and the head decorated with a blue crest.

The turtle-doves are of two species; the one is similar to that of Europe; the other (columba melanoptera) has an ash-coloured body and black wings.

There are four species of the woodpecker; the green, the Virginian, the carpenter, and the pitiu. The carpenter (picus lignarius) is less than a starling, and has a red crest, and the body is variegated with white and blue. The bill is so strong that it perforates with it not only dry but green trees, and proves very injurious to the fruit trees, by making deep holes in them, wherein it deposits its eggs. The *pitiu* (picus pitius) is of the size of a pigeon. Its plumage is brown, spotted with white, and its flesh is held in much estimation. This bird lays four eggs, but it does not, like others of its species, nest in the holes of trees, but in excavations which it makes in the high banks of rivers, or on the sides of hills.

Grey and red partridges, which, according to Feuillé, are larger than those of Europe, are very numerous throughout the country. They have an excellent flavour, particularly during the months of April and May, when they feed upon the flowers of the *sassia perdicaria*. In the marshes is found a species that is smaller, whose flesh is much less delicate. Quails are wholly

unknown in Chili, although common in many of the American settlements.

The domestic fowl, which the Indians call *achau*, is of the same breed as that of Europe, but it is asserted on the faith of an ancient tradition, that it has always been known in the country; and what tends to confirm this opinion, is the proper name which it has in the Chilian language, which is not the case with other birds of foreign extraction, such as the common pigeon, the tame duck, the goose, and the turkey. From whence it would seem that the domestic fowl, the hog, and the dog, are animals destined to accompany man in whatever country he may be placed. This opinion is confirmed by the late English navigators, who have met with them in almost all the islands of the Pacific.

Among the numerous birds that inhabit Chili, I shall notice those only that are the most remarkable, which I shall divide into two general classes, the palmated or web-footed, and the cloven-footed. The first have their toes united by a membrane, and frequent the water, where they feed upon fish, aquatic plants, or insects.

Of these, the principal is the penguin (diomedea Chilensis). This bird, on the part of the feathered tribe, forms a link of union between the classes of birds and fishes, as the flying-fish does on that of the finny race. The feet are palmated like those of a duck, but its plumage is

so fine that it appears more like hair than feathers, and instead of wings it has two pendent fins, covered with very short feathers resembling scales, which are of great use to it in swimming, but much too small for the purpose of flying. It is of the size of a common duck, but its neck is much longer; the head is compressed at the sides, and very small in proportion to the size of the body; the bill is slender, and bent a little towards the point; the upper part of the body, the wings and the tail, which is nothing more than an extension of the feathers of the rump, are of a changeable grey and blue, and the breast and belly are white. The feet, which have but three toes, are situated near the anus, and it walks in an erect posture, with its head elevated like that of a man, keeping it constantly in motion in order to preserve its equilibrium. This gives it at a distance the appearance of a child just beginning to walk, whence the Chilians have denominated it the child-bird.

Although the penguin is an excellent swimmer, it cannot keep the sea during a storm, and the bodies of those which have perished at such times, are frequently found upon the beach. I have never known it eaten in Chili, though several navigators represent it as very good food. The skin is as thick as that of a hog, and very easily separated from the flesh. The female

makes her nest in the sand, in which she lays six or seven white eggs, spotted with black.

The *quethu* (diomedea Chilensis) is of the same genus, size and form as the preceding, but is distinguished by its wings, which are wholly destitute of feathers, and by having four toes on each foot. The body is covered with a very long thick ash-coloured plumage, a little curled, and so soft that the inhabitants of Chiloé, where these birds are very common, spin it, and make bed-coverings of it, that are highly prized in the country.

The *thage* (pelicanus thagus) called by the Spaniards the alcatrace, is a species of pelican of a brown colour, remarkable for the size of its sack. This bird is as large as a turkey-cock, the neck is about a foot, and the legs twenty-two inches long. Its head is large and well proportioned, and the bill, which is a little bent at the point, is a foot in length, and serrated at the edges, a characteristic mark that distinguishes this pelican from that of Europe, whose bill is entire and smooth. The lower mandible, at a little distance from the point, is divided into two parts, that are very elastic and extensible at the base, where they open into the membraneous sack. This is only an enlargement of the skin which covers the lower jaw and the neck; it is clothed with a very short grey down, and is ca-

pable of great expansion. When this sack is empty it is scarcely perceptible, but when filled with fish, particularly at the time when the bird has young, its size is really astonishing. Nature, ever attentive to adapt the mean to the end, has furnished this bird with a large pair of wings, which are nearly nine feet in breadth from one extremity to the other; the quills are very long, and are preferred for writing to those of the goose or the swan; its tail is short and round, and the feet have four toes united by a strong membrane. It is a solitary and indolent bird, almost constantly to be seen upon the rocks, where it makes its nest, and it has usually five young at a brood. The inhabitants, after dressing them, make use of these sacks for tobacco-pouches; they are also employed for lanterns, and from their transparency answer the purpose very well.

The *cage* (anas hybrida) is a species of goose which frequents the islands in the Archipelago of Chiloé. It is remarkable for the difference of colour between the male and the female; the former being entirely white, with a yellow bill and legs; whereas the female is black, except a narrow white stripe with which the edges of some of the feathers are marked, and the bill and legs are red. In consequence of this remarkable dissimilarity, I have given to this bird the name of the hybrid, or mulatto. The *cage* is of the

size of a tame goose, but it has a shorter neck, and a longer tail and wings; the feet are shaped like those of the European goose. The male and female appear to be strongly attached to each other; they keep in pairs, and are never to be met with, like other aquatic birds, in large flocks. During the breeding season they retire to the sea shore, where the female usually lays eight white eggs in a hole which she makes in the sand.

The *flamingo* (phænicopterus Chilensis) is one of the most beautiful birds of Chili. It frequents only the fresh waters, and is distinguished by its size and the beautiful flame-colour of its back and wings, which produces a most pleasing effect when contrasted with the pure white of the rest of its plumage. Its length from the tip of the bill to the end of the claws, is five feet, but the body itself does not exceed a foot in length; it has a small oblong head, decorated with a kind of crest; the eyes are small but lively; the bill denticulated, a little bent towards the point, about five inches long, and covered with a reddish pellicle; the feet have four toes, three forward, and one behind; the tail is short and rounded, and the wings are of a length proportioned to the size of its body; the quills are perfectly white, while those of the flamingos of the other parts of America and Africa, are black. It has been said, that when young these

birds are grey; but as I have myself seen them of all ages, I can assert that they are always of the *same colour. It is also said that whenever they feed, one of the flock is placed as a sentinel, to give the alarm in case of danger to the others. This circumstance I have never witnessed; it is, however, true, that they are extremely wild, and can rarely be approached within gun-shot. As the legs of this bird are too long to permit it conveniently to cover its nest, it is compelled to obviate this inconvenience by the position of the the latter; this is usually constructed at the edge of the water, in shape of a truncated cone, a foot and a †half high; on the top of this cone is a little excavation lined with very soft down. The bird, while in the act of incubation, places itself

* Dampier, who must have seen as many of these birds as Molina, and whose veracity and accuracy are unimpeachable, asserts on the contrary that the young ones are of a light grey, and as their wing-feathers spring out they grow darker, and never come to their right colour, nor any beautiful shape, under ten or eleven months old.—(Vol 1. p. 72.) The Goarazes, or Uwaras, as Stade calls them, whose bright scarlet feathers are the favourite ornament of the Brazilian tribes, are, in like manner, first of the colour of ashes, and then brown. —*E. E.*

† Dampier says they build their nests in shallow ponds, where there is much mud, which they scrape together, making little hillocks, like small islands appearing out of the water.—Vol. 1. p. 71.

in a standing posture, with the hinder part of its body supported upon the nest, as if seated in a chair. The Araucanians value the flamingo highly, and make use of its feathers to ornament their helmets and the ends of their lances.

The *pillu* (tantalus pillu) is a species of the ibis. Its plumage is white, mottled with black, and its general resort is the rivers and the fresh water lakes. Of all the aquatic birds, the *pillu* has the longest legs, which, comprehending the thighs, are two feet eight inches in length. The size of the body, which is nearly that of a tame goose, is by no means proportionate to the length of the legs; the neck is two feet three inches long, and the region of the crop, which is small, is destitute of feathers. The head is of a middle size, the bill large, convex, and sharp-pointed, about four inches in length, and entirely bare of feathers; it has four toes on each foot, which are united at their base by a very small membrane; the tail is short and entire like that of almost all aquatic birds. The Spaniards call it the stork of Chili; but it differs from the stork in various respects. I have never seen it light upon trees or any elevated object, and it almost always continues in the marshes and on the banks of rivers, where it feeds upon reptiles; it usually makes its nest among rushes, in which it lays two white eggs, a little inclining to blue.

Those birds which have the toes separate and

not united by a membrane, are by naturalists denominated cloven-footed; these for the greater part inhabit the plains and the woods, and feed upon insects, fruits, or flesh. Of this class I shall select those that are most remarkable for the beauty of their plumage, the melody of their song, or any other quality.

The *pigda*, known under the different names of pica-flora, humming-bird, &c. is the trochilus of Linnæus, who has described twenty-two species of it. It is generally very small; the neck is short, the head well proportioned, the eyes are black and vivid, the bill is of the size of a pin, and nearly of the same length as the body, the tongue bifurcated, and the legs are short with four toes; the tail consists of seven or nine feathers the length of the body, and the wings are very long. Their colours vary according to their species; but they are in general very rich, and combine the splendour of gold and precious stones with the most beautiful shades of every hue, which they retain even after their death. They are very common throughout Chili, and during the summer are seen like butterflies hovering around the flowers, and appear as if suspended in the air. They make a humming noise with their wings, but their note is nothing more than a low warbling or chattering. The males are distinguishable from the females by the brilliancy of their heads, which shine like fire.

These birds build their nests upon trees, and form them of small straws and down; they lay two white eggs, speckled with yellow, of the size of a chick pea, which the male and female cover alternately. On the approach of winter, this little bird suspends itself by its bill to a twig, and in this position falls into a lethargic sleep, which continues the whole season. This is the time when they are chiefly taken, for when they are in full vigour it is almost impossible to catch them.

I have observed three species of this bird in Chili; the little, the blue-headed, and the crested humming-bird.

The little humming-bird (trochilus minimus) weighs only two grains, and its prevailing colour is a very brilliant green.

The blue-headed humming-bird (trochilus cyanocephalus) has a tail thrice as long as its body, which is of the size of a filbert; the bill is straight, pointed, and whitish; the head is blue with a golden lustre; the back of a shining green; the belly of a reddish yellow; and the wings blue, mottled with purple.

The crested humming-bird (trochilus galeritus) is the largest of these three kinds, and is a little less than the European wren. Its bill is slightly curved, and its head adorned with a small crest striped with gold and purple; its neck and back are green, the large feathers of

the wings and tail brown, spotted with gold, and all the lower part of the body of a changeable flame-colour.

The *siu* (fringilla barbata) called by the Spaniards *gilghero*, or the goldfinch, is nearly of the size and form of the canary-bird. It has a straight, sharp-pointed, conical bill, which is white at the base and black at the point. The male has a black velvety head, and a yellow body slightly marked with green; its wings are variegated with green, yellow, red, and black, and the tail is brown; when young its throat is yellow, but as it advances in years is entirely covered with a black hair, which begins to be visible when the bird is six months old, and continues growing until it attains the age of ten years, the usual period of its life, at which time it reaches to the middle of the breast, and its age may be very accurately ascertained by the length of its beard. The female is entirely grey, with a few yellow spots upon the wings; it has no beard, nor any song, but only a kind of occasional whistle; the note of the male is, however, very harmonious, and far surpasses that of the canary-bird; when it begins to sing, it elevates its voice by little and little, continues its strain for a considerable time, and closes with some very sweet trills; it sings all the year, and is readily taught to imitate with remarkable grace the notes of other birds. In the maritime moun-

tains the *siu* may be met with at any season, but it is found in the plains of the middle provin c only during the winter, as it quits them in the spring for the Andes, where it breeds. It makes its nest upon any kind of tree with small straws and feathers; it has but two young at a brood, but I am inclined to believe that it breeds several times in a season. This bird multiplies astonishingly, and may be seen every where; and although the peasants, who eat as well as encage them, take thousands every year, their numbers are not at all diminished; it becomes after a little time very familiar, and even attached to those whom it is accustomed to see; it feeds on several kinds of seeds, but its favourite food is the grain of the madia sativa, and the aromatic leaves of the scandix Chilensis.

The *diuca* (fringilla diuca) is of the same genus as the preceding, but a little larger, and of a blue colour; its note is very agreeable, particularly towards day-break; it keeps about houses like the sparrow, which it resembles in many respects, and I think it highly probable that it is the same bird with the blue sparrow of Congo, mentioned by Merolla and Cavazzi, and the New Zealand bird of Captain Cook, which sung so harmoniously at sunrise.

The *thili,* or Chili (turdus thilius) is a species of thrush which, as I have already observed, appears to have given its name to the country

where it is found in great numbers. Linnæus has described from Feuillé the female of this bird under the name of *turdus plumbeus*. The female is indeed of a grey colour, but the male is entirely black except a yellow spot which it has under the wings; it has the shape of a thrush, but the tail is cuneated; it makes its nest upon trees near the river with wet mud, in which it lays four eggs; its song is very sweet and loud, but it will not bear confinement; it is never eaten, as its flesh has a rank and disagreeable smell.

The *thenca* (turdus thenca) in my opinion is merely a variety of the Virginian thrush (turdus polyglottus) or of the turdus Orpheus, or centzontlatotle of Mexico, called the four hundred tongues, from the variety of its notes; it is of the size of the common thrush, but its wings and its tail, which is entire and rounded, are longer; its eyes, bill, and feet are brown; the upper part of its body is of an ash-colour, spotted with brown and white; the ends of the quills and the tail-feathers are white, and the breast and belly of a light grey; it builds its nest upon trees; this is a foot in length, of a cylindrical form, lined within with wool and feathers, and completely guarded upon the outside with thorns, except a small opening, by which the female enters and deposits her eggs,

which are four or five, and are white speckled with brown.

It is not in the power of language to convey an idea of the song of the thenca, which has the sound of a great number of birds whose notes are in accord ; it also possesses the property of imitating the note of any other bird, and its strain is generally much louder and more harmonious than that of the nightingale ; it is a gay and active bird, always in motion, and even while singing continues hopping from one bough to another. For this reason it will not bear confinement, and if shut up in a cage soon dies. It is usually to be met with near country-houses, and feeds upon almost any thing, but appears to have a decided preference for flies and tallow.

The *cureu* (turdus cureus) appears to be of a species between the thrush and the black-bird ; to the latter of which it has some resemblance, and is of the same size. The bill is a little angular and bent towards the point, the nostrils are covered with a thin membrane, and the corners of the mouth furnished with hairs ; the feet and position of the toes are like those of the black-bird, and its tail is cuneiform and about five inches long : the whole plumage is of a glossy black, of this colour are also the eyes, bill, feet, and even the flesh and bones.

This bird is highly prized for the melody and

compass of its note; it imitates very well the song of other birds, and when in a cage is easily taught to speak; it feeds upon seeds, worms, and flesh, and frequently pursues and kills small birds, the brains of which it eats. Notwithstanding this ravenous propensity it is easily tamed, and a few days are sufficient to reconcile it to confinement.

The cureu, like the starling, is a social bird, and is daily to be seen in large flocks feeding in the meadows, which, when at evening they retire to their roosts, make the air resound with their sprightly notes. They build their nests, with much skill, of small twigs interwoven with rushes, and cemented with clay, which they bring in their bills and claws. When the nest is formed, the female smooths it upon the outside with her tail, which serves as a trowel, and lines it within with hair, upon which she lays three white eggs of a blueish cast.

The *loyca* (sturnus loyca) is larger than the starling, which it resembles in its bill, tongue, feet, tail, and manner of feeding. The male is of a dark grey, spotted with white, except the throat, which is scarlet; the female is of a lighter grey, and the red on the throat is paler; it builds its nest, in a careless manner, in any hole which it finds in the ground, and lays but three grey eggs marked with brown. This bird is also valued for its singing, and is easily tamed. In its state

of freedom, the male, accompanied by the female, rises perpendicularly in the air, constantly singing, and descends in the same manner. The Indians entertain some superstitious opinions respecting the singing of this bird, and they employ the feathers of its breast to ornament their head-dresses.

The *rara* (phytotoma rara, gen. nov.) is about the size of a quail, and appears to be the only species of its genus, the passeres of Linnæus. Its bill is thick, conical, straight-pointed, serrated at the edges, and half an inch long, the tongue short and blunt, the pupil of the eye brown, the tail of a middle length and rounded, and upon each foot it has four toes, three before, and one behind, rather shorter; its general colour is grey, dark upon the back, and lighter upon the belly; the prime feathers of the wings and the side feathers of the tail are tipped with black. Its note is harsh and broken, and sounds like the two syllables that form its name. It feeds upon grass, which it has a mischievous propensity of pulling up from the roots, and often, through mere wantonness, a much greater quantity than it eats. On this account the husbandmen are at continual war with it, and the children are rewarded for destroying its eggs. It builds its nest in dark and solitary places upon the highest trees, and, by this means, escapes, in a great measure, the pursuits of its enemies; but its

numbers have, however, become considerably diminished, either from this cause, or from the species being naturally unprolific.

There are three different kinds of the parrot in Chili, one of which is constantly to be found in the country, but the others are birds of passage. The first species, called *thecau* (psittacus cyanalysios) is a little larger than a common pigeon, and is decorated with a superb blue collar; the head, wings, and tail are green spotted with yellow; but the back, throat, and belly are yellow; the tail is of a middle length and equal. These birds are very numerous, and very destructive to the corn; they fly in large flocks, and whenever they light upon a field to feed, one of their number is stationed upon a tree as a sentinel, who advertises his companions by frequent cries of the approach of danger. This renders them difficult to be approached, and the only means of obtaining a number of them at a shot is by throwing a hat in the air, which they fly at with incredible eagerness. They make their nests among the steepest declivities, in which they scoop deep and winding holes, and lay two white eggs of the size of a pigeon's. Although their nests appear to be inaccessible, the peasants take great numbers of their young. In order to do this, they let themselves down by a rope to the mouth of the holes, and draw the young parrots out with a kind of hook made for

the purpose. These are a cheap and excellent food; I have seen eight of them sold for the smallest coin of the country, about three sous. When the first brood is taken away, they hatch a second, sometimes a third, and even a fourth; to this wonderful fecundity is owing the great numbers of these birds, which frequently destroy the crops. They are easily tamed, and readily taught to speak.

Those which are migratory are the choroi and the jaguilma. I call them migratory, from their inhabiting the Andes in summer, and not appearing in Chili until the winter. Both these species are of the size of a turtle-dove, and belong to the family of parroquets.

The upper part of the body of the choroi (psittacus choraeus) is of a beautiful green, the belly is of an ash colour, and the tail well proportioned. This bird is taught to speak much better than either of the others.

The *jaguilma* (psittacus jaguilma) is entirely green, excepting the edges of the wings, which are brown. The tail is very long and pointed. This species appears to be the most prolific. In the plains situated between the 34th and 45th degrees of latitude, it is frequently seen in such numerous flocks as almost to surpass belief. When they quit a field where they have been feeding, in order to fall upon another, they frequently obscure the sun, and their chattering,

which is very unpleasant, is heard at a great distance. Fortunately, this destructive race does not arrive till after the harvest, and departs before the trees begin to put forth, otherwise they would lay waste the whole country. It is incredible what havoc they make while they stay, as they devour not only the tops of the plants, but even the roots. An inconceivable quantity of them is killed in the fields, but so far from diminishing their numbers, on the contrary, they appear to be increased at every return. Whenever these birds alight upon a field, the husbandmen furnish themselves with long poles, and, mounted on swift horses, fall upon them unexpectedly, and as they are always in large flocks, and keep very close together, they cannot fly off so quickly but that great numbers of them are generally left dead on the ground. The flesh is delicious, and preferable to that of any other species of the parrot.

In almost all parts of America is found a species of water-hen, with armed wings, especially at Brasil, where it is called the *jacana*. That of Chili, called the *theghel* (parra Chilensis) is of the size of a pie, but its legs are longer; its head is black, ornamented with a small crest, the neck, back, and upper part of the wings are purple, the throat and upper part of the breast black, and the belly is white. The quills of the wings and the tail are short and of

a deep brown; on the forehead it has a red fleshy excrescence, divided into two lobes; the iris of the eyes are yellow, and the pupil brown; the bill is conical, a little bent towards the point, and about two inches long; the nostrils are oblong and very open, and the legs, which are bare of feathers below the knees, have four long toes that are separate, but more proportionate to its size than those of the Brasil species. The spur, which is placed on the joint of the wing, is six lines long and three broad, and is of a yellowish colour and conical form.

A bird as well armed as this cannot want for means of defence in case of necessity, and it of course fights with great courage and vigour every thing that attempts to molest it. It is never seen in elevated places, and never perches upon trees, but lives wholly in the plains, and feeds upon insects and worms. It builds its nest in the grass, where it lays four fawn-coloured eggs, spotted with black, a little larger than those of a partridge. It keeps in pairs, and the male and female are almost always together, but it is very rarely to be seen in flocks. When they perceive any one searching for their nest, they at first conceal themselves in the grass, without discovering any apprehension; but as soon as they see the person approaching the spot where the nest is placed, they rush out with fury to defend it. It is observed that this bird never

makes the least noise during the day, and that it cries at night only when it hears some one passing. For this reason, the Araucanians, when at war, are accustomed to watch the cry of this bird, which serves them as a sentinel to inform them of the approach of an enemy. They were formerly accustomed in Chili to hunt these birds with the falcon, but this mode has been long out of use, and they are at present shot with fowling-pieces. It is good game, and in no respect inferior to the woodcock.

The *piuquen* (otis Chilensis) is a species of bustard larger than that of Europe. It is almost entirely white, excepting its head and the upper part of its wings, which are grey, and the first quills, which are black. Its tail is short, and composed of eighteen white feathers. It has no excrescence either beneath the throat, or upon the bill, which resembles that of the common bustard. Its feet are divided into three toes before, and a fourth, rather more elevated, behind. It inhabits the plains, where it is almost always found in flocks; it feeds upon grass, and does not begin to breed until two years old; it lays six white eggs larger than those of the goose, is easily tamed, and many of the country people have domesticated it.

The *cheuque,* or American ostrich (struthio rea) is principally found in the environs of the celebrated lake of Nahuelguapi, in the valleys of

the Andes. In height it is nearly equal to a man; its neck is two feet eight inches long, and its legs of the same length; its head small and round, and covered with feathers; its eyes and eyelids are black, and furnished with eyebrows; its bill is short and broad like that of the duck, and the feet have three toes entirely separate before, and the vestige of a fourth behind; its tail is composed of several short feathers of an equal length, which grow out of the rump. Its wings are eight feet in length from their extremities, but not calculated for flight, owing to the great flexibility and weakness of the feathers. The plumage of the back and wings is of a dark grey, but that of the other parts of the body is white. Among these birds are found some that are entirely white, and others that are black, but I consider them merely as varieties.

The cheuque has not, like the African ostrich, a horny substance upon its wings, nor callosities on the sternum, but it is quite as voracious, and swallows whatever is offered it, even iron. Its favourite food is flies, which it catches with much dexterity. It has no defence but its feet, which it employs against those who molest it. Its whistle, when it calls its young, resembles that of a man. It lays from forty to sixty eggs in a careless manner upon the ground; they are well tasted, and so large that they will contain about two pounds of liquor. The feathers are

employed for many purposes; the Indians make of them plumes, parasols, &c. M. de Pauw, who frequently loses sight of the title of his work, represents the cheuque as a degenerate species of the African ostrich, because it has three toes instead of two; but were these birds of the same species, which is far from being the case, I am of opinion that the term degenerate would be more applicable to the African ostrich, as being less perfect in its limbs, than to that of America.

The *pequen* (strix cunicularia) a species of the owl, is remarkable for the large burrows which it makes in the ground to deposit its eggs. Feuillé asserts that he himself had endeavoured to dig to the end of one of them, but was obliged to relinquish the attempt. This bird is of the size of a pigeon, but its beak is very strong and crooked, it has large nostrils, and large eyes with a yellow iris; the upper part of its body is grey, spotted with white, the lower part of a dirty white; the tail, which scarcely extends beyond the quills of the wings, is of the same colour; its thighs are covered with feathers, and the feet with tubercles, upon which are some short hairs; the toes are strong, and armed with black crooked talons. It is not so averse to light as others of its species, and is frequently seen by day in company with the female, near the mouth of its hole. Its principal food is insects and rep-

tiles, the remains of which are often found in small fragments before its hole. Its cry is lugubrious and broken, and imitative of its name. The eggs are usually four, and are white spotted with yellow. The Abbé Feuillé praises the flesh of this bird, but I never could learn that it was eaten by the inhabitants.

The *tharu* (falco tharus) is a species of eagle very common in Chili, of the size of a capon. The male is whitish, marked with black spots, and has upon its head a kind of crown formed of black feathers, longer at the sides than the middle. Its back is whitish like that of the common eagle; the feet are yellow, and covered with scales, and the toes armed with crooked talons; the great feathers of the wings and the tail are black. The female is less than the male, is of a grey colour, and has a black comb upon her head. This bird builds its nest upon the loftiest trees, with sticks placed in the manner of a square grate, upon which it heaps a considerable quantity of wool, tow, and feathers. It lays five white eggs, speckled with brown, and feeds upon several kinds of animals, and even upon carrion; but is never seen openly to pursue its prey like others of its species, but seizes it by stratagem. The male walks erect with an air of gravity; his cry is harsh and disagreeable, and whenever he utters it he throws his head back upon his rump.

The *jota* (vultur jota) resembles much the aura, a species of vulture, of which there is perhaps but one variety. It is distinguished, however, by the beak, which is grey with a black point. All the plumage is black, except the quills of the wings, which are brown; its head is destitute of feathers, and covered with a wrinkled skin of a reddish colour; the legs are brown. It acquires its colour with age; for when it is young it is almost white, and does not begin to change until after it has quitted the nest. The first black spots appears upon the back, and is very small, but extends gradually over the whole body. Notwithstanding the size of this bird, which is nearly that of the turkey, and its strong and crooked talons, it attacks no other, but feeds principally upon carcasses and reptiles. It is extremely indolent, and will frequently remain for a long time almost motionless, with its wings extended, sunning itself upon the rocks or the roofs of the houses. When in pain, which is the only time that it is known to make any noise, it utters a sharp cry like that of a rat, and usually disgorges what it has eaten. The flesh of this bird emits a fetid smell that is highly offensive. The manner in which it builds its nest is perfectly correspondent to its natural indolence; it carelessly places between rocks, or even upon the ground, a few dry leaves or

feathers, upon which it lays two eggs of a dirty white.

The bird universally known in Peru by the name of *condor* (vultur gryphus) is in Chili called *manque*, and is unquestionably the largest that has the power of supporting itself in the air. Linnæus makes its wings, when extended, sixteen feet from one extremity to the other, but the largest that I have seen was but fourteen feet and some inches. Its body is much larger than that of the royal eagle, and is entirely covered with black feathers, excepting the back, which is white. The neck is encircled with a white fringe, composed of projecting feathers about an inch in length. The head is covered with short and thin hairs, the irides of the eyes are of a reddish brown, and the pupils black. The beak is four inches long, very large and crooked, black at its base, and white towards the point. The greater quills of the wings are usually two feet nine inches long, and one third of an inch in diameter. The thigh is ten inches and two thirds in length, but the leg does not exceed six inches; the foot is furnished with four strong toes, the hindmost of which is about two inches long, with but one joint, and a black nail an inch in length; the middle toe has three joints, it is nearly six inches long, and is terminated by a crooked whitish nail of two inches; the other

toes are a little shorter, and are armed with strong and crooked talons. The tail is entire, but small in proportion to the size of the bird. The female is less than the male, and of a brownish colour; she has no fringe about the neck, but a small tuft upon the hinder part of it. She builds her nest upon the most steep and inaccessible cliffs, and lays two white eggs larger than those of the turkey.

The condors feed either upon carcasses, or upon animals which they kill themselves, and thus supply the place of wolves, which are unknown in Chili. They frequently attack flocks of sheep or goats, and even calves when they are separated from the cows. In the latter case there are always several of them together, who fly upon the calf with their wings extended, dig out its eyes, and in a few moments tear it in pieces.

The husbandmen make use of every stratagem to destroy so dangerous a bird. For this purpose they sometimes envelope themselves in the skin of an ox newly slayed, and place themselves on their backs upon the ground; the condor, deceived by the appearance, approaches the supposed dead animal to devour it, when the person within, whose hands are protected by strong gloves, dexterously seizes the legs of the bird, and holds it until his companions, concealed hard by, run up to his assistance, and dispatch it with clubs. Another mode is to form a small circular

enclosure with palisades, in which is placed the carcass of some animal. The condors, who possess great acuteness of sight and smell, are immediately attracted thereby, and as they are extremely voracious, they gorge themselves to such a degree with food, that not being able readily to rise, and obstructed by the narrowness of the enclosure, they are easily killed by those who lie in wait for them. The condor, however, possesses great strength of wing, and though filled with food, if it can once raise itself, or is upon an eminence, it will fly with great swiftness, and soon disappears in the air. M. de Bomare observes, that there is very little difference, except in its colour, between the condor and the laemmergeyer of Switzerland; and I am of opinion that it is only a variety of the same species.

Of bats, an animal that holds a middle station between birds and quadrupeds, there are but two species in Chili: the house-bat, which is in no respect different from the European, and the mountain-bat, which is of the same size and shape, and distinguishable only by its being of an orange colour. Neither of these are vampyres, as are those of the southern torrid zone, but feed entirely upon insects.

Sect. VI. *Quadrupeds.*—I have already estimated the number of quadrupeds in Chili at thirty-six species, without including those that have been imported. I have even excepted the

hog and the dog, although I do not consider them as proceeding from a European stock, as the proper names which they both have in the Chilian language distinguished them from foreign animals. Even Acosta, who wrote shortly after the conquest, does not venture to give a decisive opinion respecting the origin of the domestic hog of Peru. The hog of Chili, called by the Indians *chanchu,* is similar in its appearance to that of Europe; it is full as large, and generally white, in which respect it differs from that of Peru, which is always black.

As to the dog, without pretending that all the kinds at present found in the country were there before the arrival of the Spaniards, I have reason to believe that the little barbet, called *kiltho,* and the common dog, *thegua* in Chilian, the breeds of which are found in all parts of America, as far as Cape Horn, were known in Chili before that period. These dogs, it is true, bark like those of Europe, but this is not a conclusive reason for supposing them to be derived from that race. The general opinion that the American dog is dumb, has unquestionably arisen from the circumstance of the first conquerors haven given similar names to those animals of the new world, which bore some resemblance to those of the old. This is confirmed by the learned Abbé Clavigero, who, in his History of Mexico, says that the first Spaniards who came

to that country gave the name of dog to the *techici*,* a dumb animal, resembling the dog in its appearance, but of a very different genus. This external resemblance has given rise eventually to the opinion that the American dogs never bark, and many naturalists, who incautiously adopt this error, have been the means of perpetuating it to the present day. Another opinion, equally destitute of foundation, is, that the European dogs that were left on the island of Juan Fernandez, at the time it was uninhabited, had lost their voices, and were unable to bark, which I have been well assured by the present inhabitants is an utter falsehood.

The erroneous names given to particular animals, many of which are still retained, have proved very injurious to the natural history of America. From this source have proceeded those visionary hypothesis of the degeneracy of its quadrupeds, the supposed little stags, bears, and boars of that country, considered as so many pigmy breeds, although they have no other connection with the pretended primitive race than these ill-applied names. A very respectable modern author mentions as a proof of this degeneracy, the ant-eater, called by some authors the ant-bear, and considered as a degenerate spe-

* The crab-eater, or dog crab-eater, so called from its feeding principally upon crabs.

cies of the bear. But this quadruped differs essentially from the bear in other respects than its size, and all well-informed naturalists are agreed that this animal belongs neither to the genus nor the order of bears; it is of course ridiculous to bring forward in support of this hypothesis, two animals so distinct as to have nothing in common but a name so improperly given to one of them. I could adduce a great number of instances of this kind, were I to go through with the various quadrupeds of America that have been considered as species of the old continent, altered by the physical influence of the new.

South America possesses but a very few species of animals that are similar to those of the old world, and these have preserved their original appearance, or rather, as might be expected from the influence of so mild a climate, have improved it. Of this number, in Chili, are the the fox, the hare, the otter, and the mouse. The foxes are of three kinds: the *guru*, or the common fox, the *chilla*, or the field fox, and the *payne-guru*, or the blue fox. This last is very common in the Archipelago of Chiloé, where it is black. All these foxes are of the same size as the European fox.

In its form the hare of Chili resembles that of Europe, but is superior to it in size, for it is sometimes found of twenty pounds weight, a

fact confirmed by Commodore Byron, whose sailors killed several of them upon the coast of Patagonia. These hares are found in great numbers in the provinces of Coquimbo, Puchacay, and Huilquilemu. The flesh is perfectly white, and of a much superior flavour to that of the European hare. The otter inhabits the fresh waters of the southern provinces, and differs in no respect from that of Europe. The rat has been imported in foreign * vessels, and of the mouse there are various species; the domestic mouse, the ground mouse, and several others, which I shall more particularly describe hereafter.

In confining the number of quadrupeds in Chili to thirty-six species, I have reference only to those that are well known; but I am fully persuaded that there is a much greater number, especially in the interior of the Andes, that are as yet undiscovered or very imperfectly known.

* A ship from Antwerp, which went through the straits, is said to have carried the first rats to America. They appeared in Chili, and multiplied there so as to be very mischievous, but in Ovalles time they were still confined to the coast. (L 1. C 21.) The first cat which was taken to America was presented by Montenegro to Almagro, who gave him in return six hundred pieces. Whittington's cat hardly turned out a better venture. This is a good trait in Almagro's character—one of the best-hearted men among all the conquerors.—*E.E. Herrera, Dec. 5. L 7. C 9.*

This opinion is confirmed by the common traditions of the country; and I have been informed of eight new species that have been discovered at various times; but as the descriptions I have received of them have been very imperfect, and the animals have been seen but by few, I have thought them not sufficiently characterized to merit a place among those whose economy is well known.

Such, for instance, is the *piguchen*, a winged quadruped, or species of large bat, which, if its existence is real, forms a very important link between birds and quadrupeds. This animal is said to be of the size and shape of a tame rabbit, and to be covered with fine hair of a cinnamon colour; the nose sharp, the eyes round and shining, the ears almost invisible, the wings membranaceous, the paws short and like those of the lizard, the tail round at the root, and ending like that of a fish. It inhabits holes in trees, which it leaves only at night, and does no injury to any thing but insects, which serve it for food.

Of this kind is likewise the hippopotamus of the rivers and the lakes of Arauco, which is different from that of Africa, and in its form and stature resembles the horse, but the feet are palmated like those of the seal. The existence of this animal is universally credited throughout the country, and there are some persons who

pretend to have seen the skin, which, they say, is covered with a very soft and sleek hair, resembling in colour that of the sea-wolf.

But leaving the examination of these animals to those who have an opportunity of making farther discoveries respecting them, I shall proceed to treat of those that are known, which I shall divide into those that have toes, or are digitated, and those that are hoofed. This division, although imperfect, appears to me to be better adapted than a more technical one, for the arrangement of so small a number of species. Those which have toes are either web-footed or cloven-footed. The former live in the water, and feed upon fish. Those who inhabit the sea are the following :

The *urigne* (phoca lupina). This species of phoca, which the French and Spaniards call the sea-wolf, differs but little from the common seal; this difference principally consists in its size and colour. It is from three to six and even eight feet in length ; and its colour is brown, grey, and sometimes whitish, but all of these are merely varieties of the same species. This animal is large forward, but gradually diminishes, like a fish, towards the hinder feet, which are united within the same skin, and form the extremity of its body. It is covered with two kinds of hair, one stiff, and the other soft like that of an ox. The head is large and round, and re-

sembles that of a dog with the ears cut off, and instead of the latter it has two oblique holes which serve for the same purpose. The eyes are large, globular, and furnished with long eyelashes; the nose is like that of the calf, as is the tongue; the muzzle is short and blunt, with long whiskers, the lips being of equal size, but the upper a little channelled like that of the lion. The teeth are thirty-four in number: ten incisors, four canine, and twenty grinders. The fore feet, or more properly fins, have two very perceptible joints, one corresponding with the shoulder-blade, the other with the elbow; the metacarpal bones and the toes are cartilaginous, and enclosed in a membraneous sheath, which performs the office of a fore paw. Each of these feet has four toes, which distinguishes this from the other species of the phoca. The extremity of the body, which is tapered almost to a point, is divided into two very short parts, representing the hind feet, the joints of which are very visible. These feet are furnished with five fingers of an unequal length, like those on the hand of a man, united from the first to the third joint by a rough membrane, which completely envelopes each finger, and even extends beyond it. At the junction of the hind feet is situated the tail, which is about three inches in length. In both sexes the generative parts are placed at the lower part of the belly. They usually copu-

late the latter part of autumn, and the female brings forth her young in the spring, of which she has generally two, sometimes three at a birth. She is distinguished from the male by a longer neck, and a more delicate and beautiful form. The urigne abounds in blood, which, whenever it is wounded, flows from it in great quantities; like many other aquatic animals, it has beneath the skin a covering of soft fat; this is five inches in thickness, and easily reducible to oil. Notwithstanding the inconvenient conformation of their feet for that purpose, they readily climb up the rocks, on which they are fond of sleeping, though they walk very badly, or rather draw themselves, when on shore from one place to another. It would, however, be very imprudent to approach them carelessly, for although so heavy and clumsy in appearance, their necks have great flexibility, and they are capable of inflicting severe wounds with their long teeth.

These phocæ swim with great swiftness, and make use principally of their hind feet, which they extend in a straight line, so as at a distance to resemble the tail of a fish. They cannot remain long under water, and frequently raise their heads to breathe, or to watch the approach of penguins and other aquatic birds, of which they make their prey. The cry of the old urignes resembles the roaring of a bull or the grunting of a hog, while that of the young is more like

the bleating of a sheep. They are common upon all the coast of Chili, and in the islands; where, every year, the inhabitants kill a vast number of them with clubs, a slight blow across the nose, which is their most tender part, being sufficient to dispatch them. The skin is employed for various purposes, particularly for making a kind of float, which is used in fishing and in passing rivers. This consists of two large balloons, from eight to nine feet in length, formed of these skins, carefully joined and sewed, and inflated with air; upon these are placed several pieces of wood laid transversely, which will contain one or more persons. When the skin is well dressed it resembles coarse-grained morocco leather, but is superior to it in point of consistency and durability; shoes and boots are also made of it that are impenetrable to water. The oil which is obtained from the fat forms a considerable article of commerce with the inhabitants of Chiloé. It is used in dressing leather, and, when clarified, for burning, and is preferred to that of the whale, as it keeps better, and retains its clearness for a longer time. The sailors make use of it for frying their fish, and the taste is not unpleasant when it is fresh. In the stomach of this animal are frequently found stones of several pounds weight, which it probably swallows to triturate its food, and accelerate the process of digestion.

The *sea-hog* (phoca porcina) resembles the urigne in its shape, hair, and manner of living, but differs from it in the conformation of its mouth, which is longer, and resembles the snout of a hog. Its ears are likewise more raised, and the fore feet divided into five very distinct toes, covered with a membrane. This phoca, which is from three to four feet in length, is but rarely met with on the coast of Chili.

The *lame*, sea-elephant, or elephantine seal (phoca elephantica) is similar in form to the preceding, but distinguished from it by very striking characteristics. It is of a very great size, being frequently fifteen feet in circumference around the breast, and twenty-two feet in length Upon its nose is a comb, or glandular trunk, extending from the forehead beyond the upper lip, and serving as a species of defensive armour against blows, which upon that part are almost always fatal. The tusks of the lower jaw project at least four inches from it, and this singularity, together with the trunk, give it some faint resemblance to the elephant. The feet are divided into five toes, half covered with a coriaceous membrane indented upon the sides, each furnished with a strong crooked nail. The ears, at first sight, appear to be truncated, but, on nearer view, are found to be nearly half an inch long, and in shape like those of a dog. The skin is thicker than that of the urigne, and co-

vered with short, thick, and soft hair, the colour of which is various, being a mixture of dun, yellow, grey, and dirty white. The female is of a less size, and not so fat as the male, and has but a slight appearance of a trunk upon the nose.

Lord Anson has improperly called this animal the sea-lion; and Linnæus, from his authority, has denominated it phoca leonina, an appellation much more appropriate to another animal of the same genus, but of a very different species. The lames are found in the greatest numbers on the island of Juan Fernandez, the Araucanian coast, the Archipelago of Chiloé, and the Straits of Magellan. They herd together in large companies, and during the summer are almost continually in the sea, but on the commencement of winter they go on shore, where they bring forth their young. They copulate, like the urignes, by raising themselves on their hind feet, and have the same number of young with them. When on shore they frequent miry places, where they wallow and frequently sleep, placing, as a sentinel, one of their number upon a rising ground, who gives notice of the approach of any danger by frightful howlings.

The sea-elephant is the largest of the phoca, and produces more oil than any of the others; it is so fat that, whenever it moves, the oil is seen to undulate beneath the skin. The males appear

to be very amorous, and frequently fight for the exclusive possession of the females, until the death of one of them terminates the contest; from this cause the skins of so many of them are covered with scars. Whenever the males fight, the females retire apart, awaiting the issue of a combat which is to place them in possession of the victor.

The *sea-lion* (phoca leonina) is of a better proportioned and more elegant form than any other species of phoca, though like the rest its shape is conical. It is covered with a yellowish hair, which from the shoulders to the tail is short, but on the neck and near the head is as long as that of a goat, and forms a very perceptible mane, that distinguishes this from every other kind of phoca. The Indians call it *thopel-lame*, that is, the lame with a mane. Its head resembles that of the lion, it has a large flat nose, without hair from the middle to the tip; the ears are almost round, and stand out about two-thirds of an inch from the head; its eyes, the pupils of which are greenish, are very bright and sparkling, and the upper lip is furnished with long white whiskers, like those of a tiger. The mouth is very wide, and has thirty-four teeth set deep in the jaw, which are very large and solid, and as white as ivory; the middle teeth are about four inches in length, and an inch and a half in diameter; the incisors do not project

from the mouth, like those of the lame, but their disposition is similar to those of the urigne. In the conformation of the hinder feet it also resembles that animal, except that those of the sea-lion are palmated. The fore feet are cartilaginous, very short in proportion to its size, divided into five toes, terminated by nails, and united by a membrane, in the manner of those of the elephantine seal. The tail is about nine inches long, and is round and black.

The female is much smaller than the male, and has no mane; it has two teats, and produces but one young at a birth, towards which it discovers great affection. The Abbé Pernetty, in the account of his voyage to the Malouine islands, mentions his having seen sea-lions of twenty-two feet in length, but the largest that I have seen in Chili did not exceed thirteen or fourteen feet. These animals are very fat, and no less sanguineous than the urigne. When wounded, they immediately throw themselves into the sea, and leave a long track of blood behind them, which serves as a guide for the lames and urignes, who in this state of weakness attack and easily overcome and devour them. This disposition, however, is not reciprocal, as the sea-lion never attempts to harm any of the other phocæ, even when they are unable to protect themselves.

I have been informed by the fishermen that they have occasionally seen in these seas various

other kinds of phocæ, which may be similar to those found in the North Sea, described by Steller, and very probably some that are entirely unknown to naturalists, for I am of opinion that this genus is more abundant in species than is generally imagined.

The *chinchimen* (mustela felina) called by the Spaniards the sea-cat, is about twenty inches in length from the muzzle to the root of the tail. It has a strong resemblance to a cat in its head, ears and eyes, and in the shape and length of its tail. The nose is furnished with whiskers, and it has thirty-two teeth: twelve incisors which are straight and sharp-pointed, four canine teeth, and sixteen grinders. Each foot has five palmated toes, terminated by strong crooked nails. The skin, like that of the otter, is covered with two kinds of hair, of a light grey colour, one very short and soft, the other longer and harsh. This animal lives almost altogether in the sea, but is only seen in pairs, and never in companies. In pleasant weather it is fond of basking in the sun, and is frequently taken in snares upon the rocks, whither at such times it is accustomed to resort. The chinchimen has a hoarse cry like the tiger, it is as ferocious as the wild-cat, and like that animal springs at any one that approaches it.

Besides the otter, of which I have already spoken, the fresh waters of Chili are inhabited by the *guillino* and the *coypu*.

The *guillino* (castor Huidobrius) which I have thus named in memory of a deceased friend of great literary attainments, Don Ignacius Huidobrio, Marquis of Casa Reale, is a species of beaver, in high estimation for the fineness of its fur. Its length, from the end of the nose to the insertion of the tail, is about three feet, and its height two. The colour of the hair is grey, dark upon the back, and whitish on the belly; of this, like the northern beaver, it has two kinds, the one short and fine and softer than that of a rabbit, the other long and coarse and easily detached from the skin. The short fur readily takes any colour, and I have seen cloth manufactured from it dyed black and blue, which had all the beauty of velvet; it is also used for making hats, that are no way inferior to the real beaver. The head of this animal is almost square, the ears are short and round, and the eyes small, the nose is blunt, and the mouth is furnished with two very sharp incisors in each jaw, and with sixteen grinders; on each foot it has five toes, those before are edged with a narrow membrane, and the hinder ones are palmated; its back is very broad, and the tail long, flat, and covered with hair. The guillino produces no substance analogous to the castor; it inhabits

the rivers and the deepest lakes, and can remain a long time under water without respiring. It feeds upon fish and crabs, and is usually surprised and killed by the hunters when it goes to void its excrements, which it regularly does every day, like a cat, in the same place. It is a voracious animal, and so fearless that it frequently robs the nets and baskets of fish in the presence of the fishermen. The female has two or three young at a litter, and the period of gestation, if I am not misinformed, is about five months.

The *coypu* (mus coypu) is a species of water-rat, of the size of the otter, which it resembles in its hair and external appearance. It has round ears, and a long nose covered with whiskers; the feet are short, the tail large and of a moderate length well covered with hair, and in each jaw are two very sharp incisors. The feet have each five toes, those of the fore feet are unconnected by a membrane, but those of the hind are palmated. Though the conformation of this animal evinces that it is intended as an inhabitant of the water, it nevertheless lives very well upon the land, and even in houses, where it is easily tamed, and soon becomes reconciled to a domestic state. It eats any thing that is given it, and appears to be susceptible of much attachment to the person who feeds it. Its cry is a sharp shriek, but it never utters it except when

hurt. With a little patience and care, it might be rendered still more useful than the otter for the purpose of taking fish. The female has five or six young at a birth, by whom she is always accompanied.

Of the cloven-footed terrestrial quadrupeds of Chili, some are gramenivorous, or such as feed upon vegetables, and others carnivorous; of the latter are the *chinghue*, the *cuja*, the *quiqui*, the *porcupine*, the *culpeu*, the *guigna*, the *colocolo*, and the *pagi*.

The *chinghue* (viverra chinga) is of the size of a cat; its colour is black inclining to blue, except upon the back, which is marked with a broad stripe, composed of round white spots, extending from the forehead to the tail. The head is long, the ears are broad and well covered with hair, the eyes large with black pupils, the nose is sharp, the upper lip extended beyond the lower, and the mouth, which is deeply cleft, contains twelve incisorial teeth, four sharp canine, and sixteen grinders. The hind feet are longer than the fore, and on each foot are five toes armed with nails, which serve the animal to dig deep burrows in the earth, where it secures its young. It always carries its head down, and the tail, which is covered with long hair, turned over upon its back like the squirrel.

The urine of the *chinghue* is not, as is generally supposed, fetid, but the odour, so disgusting

to every other animal, proceeds from a greenish oil contained in a vesicle placed, as in the polecat, near the anus. When the animal is attacked, it elevates its posteriors and scatters this loathsome liquid upon its assailant. Nothing can equal the offensiveness of its smell; it penetrates every where, and may be perceived at a great distance. Garments that are infected with it cannot be worn for a long time, and not until repeated washings; and the dogs, after having been engaged with the *chinghue*, run to the water, roll themselves in the mud, howl as if they were mad, and will eat nothing as long as the smell continues about them.

The *chinghue*, when attacked, never makes use of its teeth or claws, but relies entirely upon this singular mode of defence. It appears to be attached to the society of men, and approaches them without the least apprehension, boldly enters the country-houses to search for eggs, and passes fearlessly through the midst of the dogs, who instead of attacking him generally fly at his approach. The husbandmen themselves are averse to shooting this animal on such occasions, lest, should they fail of killing it outright, they should be annoyed by its nauseous stench. In order to free themselves from this unwelcome visitor, they have recourse to another method, which is attended with less risk. Some of the company begin by caressing it, until an oppor-

tunity offers for one of them to seize it by the tail and hold it suspended. In this position the muscles becoming contracted, the animal is unable to eject the fluid, and is dispatched with safety. The *chinghue*, however, never has recourse to this mode of annoyance against those of its own species, but employs in fighting with them its teeth and claws. It preys upon eggs and poultry, which it is very dexterous in taking. Its skin is closely covered with very soft long hair, and retains nothing of that offensive smell which might naturally be supposed. The Indians, when they can obtain a sufficient number of these skins, make of them coverings for their beds, which they value highly for their beauty and the softness of the hair.

The *cuja* (mustela cuja) is a small animal resembling a ferret in its size, form, and teeth, and also in the disposition of its toes, and its manner of living. The eyes are black, and the nose a little turned up at the end like a hog's; its hair is black, thick, and extremely soft, and the tail, which is of the length of its body, is closely covered with it. Its principal food is mice, which it is in constant pursuit of. The female breeds twice a year, and has four or five young at a birth.

The *quiqui* (mustela quiqui) is a species of weasel of a brown colour, thirteen inches long from the nose to the tail. The head is flat, the

ears short and round, the eyes small and sunken, the nose cuneiform, the nostrils compressed, with a white spot between them, the mouth broad like that of a toad, and the legs and tail short. It has twelve incisors, the same number of grinders, and four canine teeth, and the tongue is very slender and smooth. The paws resemble those of the lizard, and have five toes armed with very crooked nails. It is naturally ferocious, and so very irascible, that the inhabitants give the name of quiqui to those persons who are easily irritated. It lives under ground, and feeds upon mice and moles like the cuja; the female breeds several times in a year, and always produces the same number at a birth.

The *porcupine* (histrix Chilensis) is found in the northern Andes of Chili. The inhabitants kill them for the sake of their skins. I have never seen this animal, but from the description which I have had of it, it differs little or nothing from the histrix prensile, or coandu of Brasil.

The *culpeu* (canis culpæus) is a wild dog, or rather a species of large fox, differing but little from the common fox, except in its size and its colour, which is a dark brown, and in having a long straight tail covered with short hair like that of the common dog. From the point of the nose to the root of the tail it is two and a half feet in length, and its height is about twen-

ty-two inches. The shape of its ears, the position of its eyes, its teeth, and the disposition of its toes, are precisely like those of the fox; like that animal it also burrows in the fields. Its cry is feeble, and resembles the barking of a little dog; and it preys upon small animals. Whenever the *culpeu* perceives a man, it comes straight towards him, and at the distance of five or six paces stops and looks attentively at him. If the person does not move, the animal remains for some minutes in this situation, and without attempting to do him any injury retires. This singular curiosity of the culpeu is so well known to the inhabitants, that no one is afraid of it, and I have myself several times met with it in the woods, when it has uniformly acted in the same manner. The name appears to be derived from the Chilian word *culpem*, which signifies madness or folly, and is strikingly applicable to the conduct of this animal, which constantly exposes it to be shot by the hunters, and is probably the reason why it is less common in Chili than the fox, though it is equally prolific. It is mentioned by Commodore Byron, who saw it in the Falkland islands, and supposed it at first some ferocious wild beast, from the manner of its approaching his men. Although the culpeu does not appear to be stronger than the fox, it is with much difficulty that a dog can overcome it.

The *guigna* (felis guigna) and the *colocolo*

(felis colocolo) are two species of wild-cats which inhabit the forests. They resemble the domestic cat, but have a larger head and tail. The *guigna* is of a fawn colour, marked with round black spots about five lines in diameter, extending along the back to the end of the tail. The *colocolo* has a white body, marked with irregular black and yellow spots, and the tail is encircled with black rings. They prey upon mice and birds, and sometimes are seen near country-houses, whither they are attracted by the poultry. I have been informed by some of the inhabitants that there are several other species of the wild-cat, but I have seen only the two described above.

The *pagi* (felis puma) called by the Mexicans *mitzli*, and in Peru *puma*, the name by which it is best known to naturalists, has by the Spaniards been denominated the lion, which it resembles in its shape and its roaring, but is wholly destitute of a mane. The hair on the upper part of its body is of a greyish ash-colour, marked with yellow spots, and is longer than that of the tiger, particularly on the buttocks, but that on the belly is of a dusky white. Its length from the nose to the root of the tail is about five feet, and its height from the bottom of the foot to the shoulder twenty-six and a half inches. It has a round head shaped much like that of a cat, the ears are short and pointed, the eyes large with

yellow irides and brown pupils. Its nose is broad and flat, the muzzle short, the upper lip entire and furnished with whiskers, the mouth deep, and the tongue large and rough. In each jaw it has four incisors, four sharp-pointed canine teeth, and sixteen grinders. Its breast is broad, the paws have each five toes armed with very strong nails, and its tail is upwards of two feet in length, and like that of the tiger.

The number of toes on the hinder feet would alone be a sufficient characteristic to distinguish it from the real lion, which has but four. The pagi may, however, be considered as an intermediate species between the lion and the tiger. Its cry, although not so loud, differs not materially from the roaring of the African lion, but in the season of its loves becomes changed into a shrill whistle, or rather a frightful hiss like that of a serpent. The female is rather less than the male, and is of a paler colour; like the African lioness, she has two dugs, and brings forth but two young at a time. The season of copulation is the end of winter, and the period of gestation three months.

Such is the lion of Chili; it may, perhaps, in other parts of America, offer some shades of discrimination, as I have been informed that those of Peru have a longer and more pointed muzzle. The pagi inhabits the thickest forests and the most inaccessible mountains, from whence it

makes incursions into the plains to attack domestic animals, particularly horses, whose flesh it prefers to that of any other. In its mode of seizing its prey it resembles the cat; it approaches it by drawing itself upon its belly, glides softly through the shrubs and bushes, conceals itself in the ditches, or, if it shews itself, assumes a mild and fawning appearance, and, watching the favourable opportunity of seizing the animal which it has marked for its victim, at one leap fastens itself upon its back, seizes it with its left paw and teeth in such a manner as to render it impossible for it to escape, while with the right paw in a few minutes it tears it to pieces. It then sucks the blood, devours the flesh of the breast, and carries the carcass into the nearest wood, where it conceals it with leaves and boughs of trees, in order to eat it at its leisure.

As it is a common practice for the husbandmen to fasten two of their horses together in the fields, whenever the pagi finds them in this situation it kills one and drags it away, compelling the other to follow by striking it from time to time with its paw, and in this manner almost always succeeds in getting possession of both.*

* *The wolf is said occasionally to adopt a similar mode of securing its prey. I have been assured by an intelligent foreigner, that it is not unfrequent in France for that animal, when the presence of the shepherd, or any other circumstance,*

Its favourite haunts are the streams to which animals usually repair to drink, where it conceals itself upon a tree, and scarcely ever fails of seizing one of them. The horses, however, have an instinctive dread of these places, and even when pressed by thirst approach them with great precaution, carefully examining upon every side to discover if there is danger. At other times one of the boldest goes forward, and on finding the place secure, gives notice to his companions by neighing in a sprightly manner.

The cows defend themselves well against the pagi; as soon as he appears they range themselves in a circle around their calves, with their horns turned towards their assailant, await his attack in that position, and not unfrequently destroy him.

The mares, when there are a number of them, place themselves in the same manner, though in an inverted order, around their colts, and attempt to repel their enemy with their heels, but one of them almost always becomes a victim to this proof of maternal love. All those animals that have not young, on the approach of the pagi attempt to save themselves by flight; the ass alone, from his want of speed, is compelled to defend,

prevents it from killing the sheep which it has singled out for its victim at its leisure, to seize it by the wool of the neck, and compel it to go off with it by striking it with its tail.....Amer. Trans.

himself with his heels, which frequently proves successful; but should the pagi, notwithstanding his efforts, leap upon his back, he immediately throws himself on the ground, and endeavours to crush him, or runs with all his force against the trunks of trees, holding his head down so as not to dislocate his neck. By these means he generally succeeds in freeing himself from his assailant, and there are but few asses destroyed by an enemy so frequently fatal to much stronger animals.

Notwithstanding his ferocity, the pagi never ventures to attack a man, although he is continually hunted and persecuted by the latter. He is naturally a cóward, and a woman or child will make him fly and abandon his prey. He is hunted with dogs trained for the purpose, and when hard pressed by them, either leaps upon a tree, seeks an asylum upon a rock, or, placing himself against the trunk of some large tree, defends himself in a furious manner, killing many of his enemies, until the hunter, watching his opportunity, slips a noose around his neck. As soon as the animal finds himself taken in this manner, he roars terribly, and sheds a torrent of tears. The skin serves for various uses; good leather for boots or shoes is manufactured from it, and the fat is considered as a specific in the sciatica.

Of the cloven-footed quadrupeds that feed

upon vegetables, the most remarkable in Chili are the *guanque*, the *chinchilla*, the great wood-mouse, the *covur*, the cuy, and the visaccia.

The *guanque* (mus cyanus) is a species of ground-mouse, which it resembles in its form and size, but its ears are rounder and its hair blue. It is a very timid animal, and digs a burrow in form of a gallery ten feet long, upon each side of which it excavates seven cells of a foot in depth opposite each other. These cells serve as a place of deposit for its winter provision, which consists of certain grey bulbous roots of the size of a walnut. Some pretend that these are a species of truffle, to which they bear some resemblance in taste, but I am rather inclined to believe them the roots of a plant. The manner in which this little animal arranges these roots is really admirable. They are of an angular form, but in order to leave no vacant spaces, it places them with such skill that the projecting angles of one root are fitted to the hollows of another.

In the rainy season, when the *guanque* can no longer seek its food in the fields, it has recourse to its winter hoard, and begins with the roots deposited in the farthest cells, as being the oldest, and in this manner regularly proceeds from one to the other. Its burrow is always very neat, and it is careful to carry out of it all the fragments of the roots which it has eaten. The female breeds

twice a year, in the spring and in the autumn, and has six young at a litter. In the winter the male and female, with the young of the last breed, inhabit the same burrow, those of the first being old enough to provide for themselves. The provisions laid up in their magazines are more than sufficient for the subsistence of this little family, as every spring a number of the old roots are found at the mouths of their holes, which have been brought out to make room for new. The country people are very fond of these roots, and eagerly search for the burrows, which they plunder and destroy without regard to the fate of their innocent inhabitants.

The *chinchilla* (mus laniger) is another species of ground-mouse or rat. Instead of hair it is covered with an extremely fine and soft ash-coloured wool, of a sufficient length for spinning. This animal is about six inches long; it has very small ears, a short nose, teeth like those of the common mouse, and a tail of a moderate length, covered with silky hair. It lives in the fields, under ground, in large companies, and is principally found in the southern provinces; its usual food is the bulbous roots with which that part of the country abounds. The female breeds twice a year, and has five or six young at each birth. It is an extremely gentle and mild animal, and may be handled without the least danger of its biting, nor will it attempt to escape, but on the contrary

appears to be pleased with being caressed. It is very neat, has no offensive smell, and may be kept, with very little inconvenience, in a house, and the trifling expense attending its keeping will be amply repaid by its beautiful wool. The ancient Peruvians employed this wool in the manufacture of several kinds of cloth, to which they attached great value.

The great wood-mouse (mus Maulinus) is an animal of more than twice the sizeof a marmot, and was first discovered in 1764, in a wood, in the province of Maule, and so vigorous was the defence that it made, that the dogs who attacked it had much difficulty in overcoming it. Its hair is of the same colour as that of the marmot, but its ears are more pointed, the nose is longer, the whiskers are disposed in four rows, it has four toes on each foot, and it has a longer tail, and closer covered with hair. The number and order of the teeth are the same as those of the common mouse.

The *degu* (sciurus degus) is a species of dormouse, a little larger than the house-rat. Its colour is a dirty white, except a blackish line upon the shoulders, which reaches to the first joint of the leg; the tail is terminated by a little tuft of hair of the same colour as the body. The head is short, the ears round, the nose sharp, and furnished with whiskers; of the upper jaw the two incisors are cuneiform, those of the lower

flat; the fore feet have four toes, the hinder five. The degu is a social animal, and is found in the vicinity of St. Jago, in numerous companies, near the hedges or bushes, where they dig burrows that have a communication with each other, and feed upon roots and fruit, of which they lay in an ample store for the winter. It does not, like the dormouse and the badger, sleep during the winter, which is probably in a great measure owing to the mildness of the climate. These animals were formerly eaten by the inhabitants, but at present they make no use of them whatever.

The *covur*, known to naturalists by the name of *tatou*, and by the Spaniards called the *armadillo*, from the upper part of its body being covered with a kind of bony armour, is very common in Cujo, where it is called *quiriquincho*. It is of various sizes, being from six to thirteen inches long, a magnitude, however, much inferior to what it attains in the tropical regions. In its external appearance, its fatness, and the bristles which cover the lower part of the body, the *covur* resembles the guinea-pig. Its head is long, but the nose is short; it has no teeth except grinders; the eyes are small, the ears naked, and the tail is long and scaly like that of a rat. The number of the toes vary according to the species. The bony armour which covers the body of the animal is composed of two parts, divided into

several bands let into each other, so that the animal can at its pleasure dilate or contract them. The females are very prolific; they have four young at a birth, and breed every month. The flesh is delicate, and much preferable to that of the guinea-pig.

In the valleys of the Andes are found four species of this animal:

The *pichi,* or four banded covur, which is about six inches in length.

The hairy, or the eight banded, which is seven inches long, and covered with hair as well above as below.

The *mutillos,* or the eleven banded, which is very little larger than the preceding, but its ears are much longer.

The *bolas,* or the eighteen banded, which is the largest, and is thirteen inches in length from the nose to the root of the tail.

These four species belong to the *quiriquinci* of Buffon, a name which has been given them from their possessing the property of contracting and rolling themselves up like a ball. When they are hard pressed by the hunters, they frequently contract and roll themselves down a precipice, like the hedge-hog, and usually escape without injury, being protected by their coat of mail. But they have not the same means of escape when they are found in the plains; they are

then easily taken, and when they roll themselves up are compelled to resume their natural form by means of fire. The three first kinds run very fast in a straight line, being prevented by the conformation of their armour from making turns. When they get at a certain distance from their pursuers, they endeavour to dig a hole in the ground to conceal themselves, and hold so fast with their fore paws that it is almost impossible to force them away; upon these occasions the hunters have contrived a singular expedient to make them quit their hold, by introducing the point of a small stick into the anus.

The *cuy* (lepus minimus) is a species of small rabbit, which has been by some confounded with the guinea-pig, though it is not only distinguished from that animal by its form, but by its generic character. It is a little larger than the field-mouse, and its shape is nearly conical. The ears are small, pointed and hairy, the nose is long, and the teeth are precisely like those of the hare and the rabbit; its fore paws have four toes, and the hinder five, and the tail is so short that it can scarcely be seen. This animal has been domesticated in Chili, and is of various colours, white, brown, grey, and spotted. Its hair is very fine and silky, but too short for spinning; the flesh is very white, and delicately tasted. The female breeds every month, and has from six to

eight young. The cuy, though it resemble the rabbit, avoids its society, and never copulates with it. It is very much afraid of cats and rats, which appear to be its destroyers. In Peru there is an animal which bears the same name, and is also domesticated, but as I have never seen it, I cannot determine whether it is of the same species or otherwise. It may be proper, however, to observe, that *cuy* is a general name in America for a number of little animals like rabbits, which are mostly of the genus of the cavy.

The *viscacha* (lepus viscacia) is an animal resembling both the rabbit and the fox. It is rather larger, but has the head, ears, mouth, whiskers, teeth, feet, and nearly the same manner of feeding as the rabbit. In its colour and tail it resembles the fox; the hair on the body is very fine and soft, and is capable of being advantageously employed for many purposes. The ancient Peruvians made beautiful cloths of it, and it is now used in Chili for the manufacture of hats. The tail, with which it defends itself against its enemies, is very long, turned up, and covered with long coarse hair. The *viscacha* breeds in the same manner as the rabbit. It lives under ground, in a burrow consisting of two stories, which communicate by means of a winding stair-way; the first story serves for a magazine for its provisions, the other for a place of residence for itself and its young. In this it remains during the

day, and only goes out at night, when it brings to its hole whatever it meets with, even such articles of wearing apparel as have been dropped by travellers. Its flesh is very white and tender, and is preferred to that of the hare or the rabbit.

Of the horny-footed animals, or those that have hoofs, whether single or divided, Chili furnishes but five species that are indigenous. The *puda*, the *vicugna*, the *chilihueque*, the *guanaco*, and the *guemul* or *huemul*.

The *puda* (capra puda) is a species of wild goat, with brown hair, of the size of a six months kid; the male is furnished with very very small horns, but the female is destitute. The Spaniards call it the roe-buck, but very improperly, as it has no resemblance to that animal, but every characteristic of the goat, except the beard, and in having its horns round, smooth, and diverging. On the approach of winter, these animals, in very numerous flocks, come down from the Andes, in order to feed in the plains of the southern provinces. Great numbers are then killed by the inhabitants for food, and caught for the purpose of domesticating them, which is easily done, as this animal is extremely mild, and is much delighted in playing with children.

The *vicugna*, the *chilihueque*, and the *guanaco*, may be considered as so many inferior species of

the camel, to which may be added the *alpaca* and the *llama* of Peru. All these animals have a great resemblance to the camel, although they are smaller, and their forms are more elegant and better turned; like the camel they have a small head without horns, a very long neck, middle-sized ears, large and round eyes, a short muzzle, the upper lip more or less cleft, the legs longer than the size of the body appears to require, the feet divided, the tail short, and the hair long, and of a sufficient fineness for spinning. Their genital parts are similar to those of the camel, and the males, in like manner, void their urine backwards. In their internal conformation they differ but little from the camel, and, like all ruminating animals, have four stomachs; the second of which contains, between the two membranes that compose it, a great number of cavities which appear to be intended solely for reservoirs of water.

These American camels resemble those of the old continent also in their dispositions and their mode of living; like them, they are extremely docile, and generally very mild. The alpaca and the llama are employed, like the camel, to carry burdens, and possess the following properties in common with that animal: they kneel in order to receive or discharge their loads; their hoofs are so firm as not to require shoeing, and their skins so thick as to render a pack saddle unnecessary,

and their step is slow, but sure even in the steepest mountains. The chilihueque was formerly employed by the Chilians, as the paco is by the Peruvians; but the introduction of the use of mules, which have now become very numerous, has entirely superseded that of the chilihueque. All these animals pass a great part of the night in ruminating; and whenever they wish to sleep, fold their legs under their belly, and support themselves upon the breast.

Though these quadrupeds are analogous to the camel, they have likewise some peculiar characteristics which distinguish them from that animal. Destined by nature to live among ice and snow, their bodies are covered with a thick fat between the skin and the flesh, like almost all polar animals; like them too they abound in blood, which is the more necessary to them, as they require a greater degree of warmth than those animals which inhabit the plains: the fat preventing the evaporation of the heat, and thereby keeping up that temperature of the blood without which they would not be able to endure the severity of the cold. The lower jaw, like that of the camel, is furnished with six incisors, two canine teeth, and several grinders; but the upper is wholly destitute of incisors and canine teeth; a character which appears to me sufficiently marked to constitute a separate genus. Besides this distinction, their ears are smaller

and more elegant than those of the camel; the nose is smooth, the neck straighter and better proportioned, the back more level, except the guanaco's, which is a little arched, the tail handsomer, and supplied with a greater quantity of hair, the legs are better shaped and fitted for running, and the hair on their bodies is longer, softer, and more like wool. Placed by the side of one of these animals, the camel would appear like a monster. Their natural cry resembles the neighing of a horse. To defend themselves they employ their saliva, which they throw upon those who molest them. It is asserted, but it appears to be without foundation, that this saliva is naturally caustic, and produces blisters upon the skin.

They are in heat in the latter part of summer, during which time they become very thin, and shed their hair. Before copulation they make much noise, throw out their saliva, and appear to be mad. The female has two dugs, which are always well filled with milk; her period of gestation is five or six months, and she produces but one young at a birth. These three kinds of animals mutually avoid each other, nor have they ever been known to copulate. To what age they live I am unable precisely to determine, though I believe them shorter lived than the camel; the period generally assigned them by the Chilians is thirty years.

I consider these animals as intermediate species which unite the goat, sheep, stag, and the camel; and from the following descriptions it will be seen that my opinion is not unfounded.

The *vicugna* (camellus vicuna) is, according to M. Buffon, only the paco in its original state of liberty; but in this, as well as in many other particulars which concern America, that great naturalist has been misinformed. The paco, or the alpaco, and the vicugna are two animals of the same genus, but of very different species. It is certain that they never copulate, although they live upon the same mountains, and the wild paco, as well as the tame, is very common in Peru. The vicugna is nearly the size of the tame goat; it resembles it particularly in the shape of its back, rump, and tail, but differs from it in having a much longer neck, which is frequently twenty inches in length, in its head which is round and without horns, in its ears which are small and straight, in its muzzle which is short and without a beard, and in its legs which are twice the height of those of the goat. It is covered with a very fine wool of the colour of dried roses, which will take any dye, and is used in the country in the manufacture of a variety of cloths. This wool is known in Europe, and very highly valued. The paco is most robust and of or thicker make than the vicugna; its muzzle is longer, and its wool is also longer and not so

fine. The Peruvians keep numerous flocks of pacos, whose wool they employ in the manufacture of several kinds of cloth, which have the brilliancy of silk. But the paco is not found in Chili either in a domestic or savage state.

The vicugnas appear to be more particularly attached to that part of the Andes which appertains to the provinces of Copiapo and Coquimbo, where they are found in the greatest numbers, and inhabit the highest and more inaccessible ridges of mountains perpetually covered with ice and snow. This cold climate seems to be best adapted to their nature, for all those which the inhabitants have attempted to raise in the plains have been attacked by a species of mange, which has soon destroyed them; and it is most probable owing to this cause that the methods which have been hitherto used to transport this animal to Europe have failed of success. The vicugnas are always in flocks, and, like the goats, are seen feeding on the tops of rocks. As soon as they perceive a man they run off, taking their young with them. The hunters, when they go in pursuit of them, endeavour to surround the mountains upon which they are found, and by pressing them closer and closer, they at length collect the whole within a small compass, when they encircle the spot with a rope, to which they tie a great number of pieces of cloth. The vicugnas, who are very timid, dare not pass this

cord, and easily fall into the hands of their pursuers, who usually kill the whole of them. As the wool of these animals is the chief inducement for hunting them, instead of killing, it would, perhaps, be more prudent merely to shear them, an operation which might be repeatedly performed. Their numbers, however, notwithstanding these massacres, do not appear to be diminished, which induces me to believe that they have more young at a birth than is generally supposed. The inhabitants have never yet been able to domesticate this useful animal, but I do not doubt it will be effected, when the national industry, which is beginning to exert itself, attains a greater degree of activity. The vicugna is excellent game, and its flesh is preferred to veal; it is used as a specific in cases of the ophthalmy, by external application. The bezoar which is found in its stomach is in high repute with those persons who have confidence in such things.

The *chilihueque* (camellus Araucanus) was originally called hueque, but the Araucanians, with whom this animal lived in a domestic state, in order to distinguish it from the European sheep, which has become very common since the arrival of the Spaniards, gave it the name of chilihueque, or rehueque; which signifies the sheep of Chili. This name is well applied to it; for, excepting the length of its neck and legs, it has considerable resemblance to the sheep. The head of the chi-

lihueque is very much like that of the sheep; its ears are also oval and flaccid, the eyes large and black, the nose long and bunched, the lips thick and hanging, the tail of a similar form, but shorter, and the whole body covered with a very long and soft wool. The length of the chilihueque, from the upper lip to the root of the tail, is about six feet; and its height, measured from behind, is nearly four feet. The individuals of this species vary in colour; there are some of them which are white, others brown, black, and grey.

The ancient Chilians made use of these animals as beasts of burden, and were accustomed to lead them by a rope fastened to a hole made in the rim of the ear, from whence has arisen the errors of several geographical writers, who have asserted, that the sheep which had been carried to Chili had so far increased in size, that they were loaded and employed as mules in the transportation of merchandize. Some writers pretend that, before the arrival of the Spaniards, the Chilians employed the hueque in the cultivation of their lands, and for drawing a kind of cart which they called quetahue. This agrees with the account of Admiral Spilsberg, who says that the inhabitants of Mocha made use of them when he landed there. The chilihueques are highly valued by the Araucanians; who, though they are fond of their flesh, never kill them except upon festivals, or on some solemn sacrifice.

Before the conquest they employed the wool of this animal to make their clothes; but since sheep have multiplied so much, they make use of the wool of the chilihueque only for the most valuable cloth.

What M. de Buffon and the celebrated Linnæus have said respecting the paco and the vicugna being of the same species, they have likewise asserted of the guanaco and the llama. Both these naturalists have taken the llama for the domesticated guanaco, but I have good reasons for being of a different opinion. Besides the natural aversion which subsists between these two animals, and which prevents them from ever mingling, they also offer some very striking differences which can never be attributed to the change of situation alone. The llama has a straight back, all its legs nearly of an equal length, and an excrescence on the breast which is almost always moistened with a yellowish oily exudation. The guanaco, on the contrary, has a bunched or rather an arched back; the hind feet are so long that when it is pursued it never attempts to ascend the mountains, like the llama, the paco, and the vicugna, but descends them, leaping, like the buck and the deer; a course well suited to the peculiar conformation of its legs.

The *guanaco* (camellus huanacus) exceeds the chilihueque in size; and I have seen some of them that were the height of a horse. Its usual length, however, from the nose to the tail, is

about seven feet, and the height, measured before, four feet and three inches. The body is covered with very long hair, of a reddish colour upon the back, and whitish under the belly; its head is round, the nose pointed and black, the ears straight like those of a horse, the tail short, and turned back like that of the stag.. The name *guanaco*, by which it is commonly known, is Peruvian; it is called *luan* in Chili. The guanaco appears to be less attached to a cold climate than the vicugna. In the beginning of winter these animals quit the mountains they inhabit during the summer, and appear in the valleys in large herds, usually of a hundred or two hundred. The Chilians hunt them with dogs, but they commonly take only the youngest, which are the least swift; the old ones run with astonishing rapidity, and it is difficult to overtake them with a good horse. When they are pursued, they turn from time to time to look at the huntsman, neighing as loud as they can, and then set off anew with increased velocity. It sometimes happens that the Indians, who are mounted upon very swift horses, take them alive, by means of a noose or sling, which they throw from a distance between their legs. This noose, which the Indians call *laqui*, is made of a strip of leather, about five or six feet long; to each end of which is fastened a stone of about two pounds weight. The huntsman, who is on horseback, holds one of these stones in his hand, and whirls the other around like a sling,

as swift as possible, in order to hurl it with more force, when he throws it at the animal he has singled out, whom he is almost certain of striking, frequently at more than three hundred paces distance. In order to take the animal alive, the sling must be thrown so dexterously, as only to twist itself around the feet. The guanaco is naturally gentle, and readily becomes accustomed to a domestic state; it can be tamed to such a degree as to follow its master whereever he wishes. The meat, especially when the animal is young, is excellent, and as good as veal; that of the old ones is tougher, but is very good when salted; it keeps well on long voyages, and is often put up for the use of seamen. Very good hats are made from the hair, and it may be used in the manufacture of camlet.

The *guemul*, or *huemul* (equus bisulcus) is an animal which I have classed with the horse, although it ought to form a separate genus, in consequence of its hoofs being divided like those of ruminating animals. Its teeth, and the manner in which they are disposed, are precisely like those of the horse; but its size, hair, and colour give it a greater resemblance to the ass, with which it might readily be confounded, were it not for the ears, which are short, straight, and pointed like those of the horse. It also wants the black stripe upon the back which is peculiar to that species. The huemul is farther distin-

guished from the ass by a handsomer head, and a more elegant appearance; the neck and buttocks are also better formed. A great difference likewise prevails in its internal conformation, and its voice is more like the neighing of a horse, than the braying of an ass. This animal is more unruly than the vicugna, and far exceeds it in swiftness; it inhabits the most inaccessible parts of the Andes, which is the reason of its being so difficult to be taken. It is the same animal which Captain Wallis found at the Straits of Magellan, and, in my opinion, forms the link between the ruminating and single-hoofed animals.

Horses, asses, cattle, sheep, goats, many kinds of dogs, cats, and even mice, have been brought hither by the Spaniards. All these animals have multiplied exceedingly, and have increased in size, as might be expected from so favourable a climate. The horses of Chili possess all the good qualities of their species: they have spirit, vigour, and swiftness. Those which are bred in the plains resemble the Arabian horses; they are of a middle size, but remarkably active. The mountain horses are stronger and closer set, and are very good for the harness; they have, in general, an elegant appearance, a small and handsome head, the tail well furnished with hair, and a little raised, the chest broad, and well turned, the thighs round and plump, the legs slender and nervous, and the hoof so hard as not to require

to be shod, except in cities. The great number of horses, and their cheapness, is the reason why they are worse treated in Chili than almost any country in the world. A common horse will cost a *felippo* (about four shillings sterling) a mare about five Roman paolis, or about two shillings sterling. They are fed entirely upon grass, and are kept in the field throughout the year. It is very uncommon to see a peasant walk half a league; the moment he rises he goes and saddles one of his horses, and uses him the whole day, wthout allowing him any time to rest or to feed. To this may be added the long journeys of a hundred leagues and more, which these people make with the *same horse, during the whole of which the horse is only permitted to rest at night.

Horses capable of enduring such hardships, must be naturally of a firm and strong constitution; but it is perhaps, in a great measure, owing to their being early accustomed to severe fatigue, and the nature of their food, as I have seen those which were very old, and had been in constant service. The horses, in consequence of their different gaits, are divided into three breeds, the most common of which are the trotters. The horses of this breed, as the most robust and vi-

* In Paraguay and Tucuman they are more humane. Led horses are always taken there for a journey.—*E. E. Dobrizhoffes.*

gorous, are principally used by the country people. The second are the pacers, who are more easy gaited than the best Andelusian horses. It is said that this step is peculiar to this breed, and that it is observable even in the colts; it is the best supported, and the quickest upon a long journey, for which reason this breed is intimae request than either of the others. The parade horses constitute the third breed; these never go out of a foot pace, move with much grace, and are particularly in demand in Peru, where they are employed on occasions of parade and ceremony; the price of them is from one hundred to five hundred crowns.

The Chilians are very careful to preserve the breed of their horses pure, and not suffer any intermixture. During the winter almost all the horses are kept at pasture in the valleys of the Andes, from whence they return in the spring very fat and vigorous. When the inhabitants train their colts, which is commonly done at three years of age, they begin by scoring the upper muscle of the tail, to prevent the motion of it, which operation they call *castige*.

The asses of Chili are so strong and tall, that it is difficult to recognize in them the original stock. I scarcely know to what circumstance to attribute this favourable alteration, unless it may be the state of liberty in which these animals live, for they are made but very little use of; in

the valleys of the Andes they are even found in a wild state, and are hunted by the Chilians for the sake of their skins; among these are some that have hair sufficiently long to be spun with ease. The mules are an excellent breed; they are very strong, and are particularly distinguished for being very sure footed and active.

The horned cattle, upon which the influence of climate appears to be greater than on others, have in Chili, owing to its favourable temperature, acquired a larger size, while their flesh has become better, and more nutritive. The oxen of the maritime are, however, of an inferior size to those of the middle provinces, nor can these last be compared to those which are bred in the valleys of the Andes. These cattle are kept the whole year in the open field, and their food, which never fails them, consists entirely of the different kinds of herbs and grasses which follow each other in succession. The species, far from exhibiting any degeneracy, has improved considerably; and though I have observed that the cattle of the maritime provinces are small, it is only in relation to the others, for I have seen some of them which weighed near two thousand pounds.

There are some landholders in Chili, whose farms are sufficient to keep twelve thousand head of cattle. At the end of each winter they usually select a thousand head, either cows or oxen, in

order to fatten them; for this purpose, they drive them to the richest pastures, where they usually keep them till about Christmas, when they kill them. This slaughter, which is always a great festival for the peasants, is expected with the utmost impatience, and they conduct it as follows:—The herdsmen drive twenty or thirty of these fat cattle into an enclosure made with stakes, which is always erected upon a plain; the peasants, well mounted, surround the enclosure, and when they have taken their stations, one of the cattle is let out. As soon as the beast finds himself at liberty he takes flight, and all the company pursue him, each endeavouring adroitly to hamstring him with a sharp iron, shaped like a crescent, attached to the end of a lance. Whenever a beast falls, the butchers immediately dispatch him, by thrusting a kind of long knife into the nape of his neck. When all the beasts are killed, they are dragged to one spot, where they are flayed, and the tallow separated from the beef. This last they usually cut up into long narrow strips, salt it a little, and dry it in the sun. A very considerable commerce is carried on in this beef, especially with Peru and the mines. It keeps very well; and, as it is not strongly salted, is preferred to the salt provisions received from Holland and England. The tallow is mostly exported to Peru, very little being used in the country; it is the same

with the hides, the greater part of which are sold to strangers. The milk is of the best and richest quality, and the inhabitants make excellent cheese from it, which is no way inferior to the best of Lodi. Of the cheese, that of Chanco, in the province of Maúle, is the most celebrated. The cattle are not employed in labour till three years old, and never more than two are tackled to a plough, even in breaking up new grounds. Instead of a yoke being suspended to their necks, a rope, agreeably to the Spanish custom, is run through their horns, by which they draw the plough. The common price of cattle throughout the country is from three to four filippi (twelve or sixteen shillings sterling); but in the sea-ports the price is fixed, by an ancient regulation, at ten crowns, of which the commandant of the port receives four, and the owner six.

The sheep imported from Spain have lost nothing in Chili; they are of the same size, and their wool is as beautiful as that of the best Spanish sheep. Each sheep yields annually from ten to fifteen pounds of wool; the mutton, especially that of the wethers, is very fine. They generally breed twice a year, as is common in temperate climates, and frequently have two at a birth. The sheep have no horns, but rams are frequently seen which have four and even six horns. The owners leave them the whole year in the open fields, without any shelter, and only

shut them up in a kind of pen to secure them from the wild beasts. Those which are bred in the Andes are larger, and produce a longer and finer wool. The Pehuenches, a nation which inhabits a part of these mountains, have crossed the breed of the sheep with the goat, and this mixed breed is much larger than the other sheep; their hair, which is more or less curled, has the firmness and softness of wool, and is frequently two feet long; it resembles much the hair of the Angora goat.

The goats have also multiplied astonishingly; they live almost always in the mountains; their skins are employed for manufacturing morocco; of this much is consumed in the country, and great quantities are sent to Peru.

Man in Chili enjoys all the advantages which result from a mild unchangeable climate, and those persons who do not shorten their lives by irregularities, attain to a very *advanced age. Notwithstanding what M. de Pauw has asserted, I have myself known several old men of a hundred and four, a hundred and five, and one instance even of a hundred and fifteen years of age.

* It appears beyond a doubt, from the concurrent testimony of all writers who have lived in South America, that the natives live to a hundred more frequently than Europeans to fourscore. The fruit hangs there upon the tree till it drops;—every where in the Old World the rude climate shakes it down.—*E. E.*

It is but a few years since that Don Antonio Boza died there at the age of one hundred and six. My grandfather and my great grandfather, both creoles, lived, the first to the age of ninety-five, the other to ninety-six. These instances are not uncommon among the natives of the country. The women are generally prolific, and there are few countries where they more frequently give birth to twins. This fecundity, and the abolition of some practices which were injurious to the propagation of the human species, will explain the rapid increase of population, which has taken place within the last thirty years.

The inhabitants of Chili are either aboriginal, or the descendants of Europeans or Africans. Those descended from Europeans are well shaped, particularly the women, some of whom are very beautiful. The aborigines form but one nation, divided into many tribes, all of whom speak the same language, which they call Chiliduga, or the Chilian tongue. This language is soft, harmonious, expressive, and regular, and possesses a great number of words, not only expressive of natural objects, but also of moral and metaphysical ideas. The colour of the natives is a reddish or coppery brown, excepting the Boroanes, who live in the midst of the Araucanian provinces, in the thirty-ninth degree of latitude; these are white, and as well featured as the northern Europeans. Nothing appears to me to be more ridiculous than the assertion of several au-

thors, that all the Americans resemble each other, and that from seeing one you are able to judge of the whole. These gentlemen seem to have been led into this error by a very slight resemblance, arising from their colour. It is only necessary to see different individuals to be convinced of the contrary. A Chilian is as easily distinguishable from a Peruvian as an Italian from a German. I have seen natives of Cujo, of Paraguay, and of the Straits of Magellan, and I can confidently affirm, that their countenances present a very striking difference. The Chilians, like the Tartars, have but little beard, and the custom which they have of plucking out the hair as fast as it grows, makes them appear as if beardless; for this purpose they always carry with them a small pair of pincers, which forms a part of their toilette. There are some of them, however, who have as thick a beard as the Spaniards. The hair which marks the age of puberty they have in still greater quantities than the beard. The opinion that a thin beard is the mark of a feeble body, is not verified in the case of these people. The Indians are generally vigorous, and are better able to endure fatigue than the creoles, for which reason they are always preferred in those employments that require strength.

Those who inhabit the plains are of the same height as the Europeans; but the natives of the mountains are distinguished by a taller stature;

and I am well convinced that these are the famous Patagonians, of whom so much has been said. Lord Anson is of the same opinion, and the descriptions given by Byron, Wallis, Carteret, Bougainville, Du Clos, and De la Giraudais, of these pretended giants, agree perfectly well with the appearance of the mountaineers of Chili. What confirms me in my opinion is, that their language, from the specimens of it which those navigators have given, is the Chilian. I have elsewhere showed that the Chilian language does not extend beyond the limits mentioned in the commencement of this work; besides which, the Patagonian contains a great number of Spanish words, which proves fully a communication between the two nations. The usual height of these inhabitants of the mountains is five feet seven inches; the tallest that I have seen did not exceed six feet three inches; but what makes them appear much larger is the enormous size of their limbs, which do not appear to be adapted to their height, except the hands and feet, which, in proportion to the rest, are very small. The *tout ensemble* of their countenances is not bad; they have usually a round face, a nose rather large, very sprightly eyes, remarkably white teeth, black and coarse hair, and some of them wear whiskers. They have generally a browner complexion than the other Chilians, from their being constantly in the open air.

The dress of those who live in the western valleys of the Andes, consists of various kinds of woollen cloth; but those who inhabit the eastern, or the true Patagonians, cover themselves with the skins of guanacos and other wild animals. Some of them wear the *poncho* of the Araucanians, which is a kind of cloak, of an oblong form, with a hole in the middle to put the head through. The Pehuelques, who occupy the southern Andes, wear a leathern hat, decorated with feathers; they paint their bodies and faces of various colours, particularly their eyelids. The women, who are all of a lofty stature, dress much like the men, except that, instead of breeches, they wear a small apron.

All these people live under tents made of skins, which they easily transport from one place to another, whither they remove for the convenience of pasturage. They are divided into several tribes, each of which has its particular chief, to whom they give the name of Ulman; like the other Chilians, they are idolaters. Their language is every where the same, except that the eastern tribes have rather a guttural pronunciation. These people are almost constantly during the day on horseback; their saddles are made like the pack-saddles of our asses, the bridle is a leather string, the bit, stirrups, and spurs, are of wood, but notwithstanding the rudeness of this equipage, they are good horsemen, and al-

most always ride upon the full gallop, followed by a great number of dogs, who are trained to hold the horse by the bits when the rider alights. The eastern Chilians have no horses that exceed the middle size, probably from their riding them when very young, and allowing them too little rest. Although they are not in want of cattle for food, they prefer game to any thing else; and they are almost always to be seen in chase of the guanaco or the ostrich, in the vast plains that extend from the mouth of the Plata to the eastern part of the Straits of Magellan. The weapon which they employ in hunting and in war, is the *laqui*, of which I have already spoken. It was with this that they killed forty Spaniards, in a skirmish at Saint Luis della Punta, in 1767. These mountaineers sometimes attack the caravans which pass from Buenos Ayres to Chili, and frequently the country houses belonging to the capital.

Between the southern boundaries of Chili and the Straits of Magellan, there are no nations except the Pojas and the Caucaus. The Pojas are of a gigantic stature, but their language is entirely different from that of the Chilians, and they never approach their territories. The Caucaus are of a middle stature, and their language is also very different from the Chilians; these last dress themselves in garments made of the skins of sea-wolves.

The above sketch will serve to give some idea of the inhabitants of Chili; but in my second part, containing the civil history of those people, I shall treat more fully of their manners and customs, as well as of their military expeditions.

A METHODICAL TABLE

OF THE

VARIOUS SPECIES OF NATURAL PRODUCTIONS

DESCRIBED IN THIS WORK,

ARRANGED IN THE MANNER OF LINNÆUS.

REGNUM ANIMALE.

MAMMALIA.

BRUTA.—Dasipus *quadricinctus* cingulis quatuor, pedibus pentadactylis.

Dasipus *octocinctus* cingulis octo, palmis tetradactylis, plantis pentadactylis.

Dasipus *undecimcinctus* cingulis undecim, palmis tetradactylis, plantis pentadactylis.

Dasipus *octodecimcinctus* cingulis duodeviginti, palmis tetradactylis, plantis pentadactylis.

FERAE.—Phoca *Lupina* capite subauriculato, palmis tetradactylis.

Phoca *Porcina* capite auriculato, rostro truncato prominente.

Phoca *Elephantina* capite antice cristato.

Phoca *Leonina* capite postice jubato.

Canis *Culpæus* cauda recta elongata, apice concolore lævi.

Felis *Puma* cauda elongata, corpore cinereo subtus albicante.

Felis *Guigna* cauda elongata, corpore maculis omnibus orbiculatis.

Felis *Colocola* cauda elongata, corpore albo maculis irreg. atris, stavisque.

Viverra *Chinga* atro caerulea, maculis quinque dorsualibus rotundis albis.

Mustela *Felina* plantis palmatis pilosis, cauda tereti elongata.

Mustela *Cuja* pedibus fissis, corpore atro labio superiore subtruncato.

Mustela *Quiqui* pedibus fissis, corpore fusco, rostro cuneiformi.

GLIRES.—Lepus *Viscacia* cauda elongata setosa.

Lepus *Minimus* cauda brevissima, auriculis pilosis concoloribus.

Castor *Huidobrius* cauda longa compresso-lanceolata, palmis lobatis, plantis palmatis.

Mus *Cyanus* cauda mediocri subpilosa, palmis 4-dactylis, plantis 5-dactylis, corpore ceruleo subtus albido.

Mus *Laniger* cauda mediocri, palmis 4-dactylis, plantis 5-dactylis, corpore cinereo lanato.

Mus *Maulinus* cauda mediocri pilosa, auriculis acuminatis, pedibus pentadactylis.

Mus *Coypus* cauda mediocri subcompressa pilosa, plantis palmatis.

Sciurus *Degus* fusco stavescens, linea humerali nigra.

PECORA.—Camelus *Huanacus* corpore piloso, dorso gibbo, cauda erecta.

Camelus *Vicugna* corpore lanato, rostro simo obtuso, cauda erecta.

Camelus *Araucanus* corpore lanato, rostro superne curvo, cauda pendula.

Capra *Puda* cornibus teretibus laevibus, divergentibus, gula imberbi.

BELLUAE.—Equus *Bisulcus* pedibus bisulcis.

AVES.

ACCIPITRES.—Vultur *Jota* niger remigibus fuscis, rostro cineraceo.

Vultur *Gryphus* maximus, caruncula verticali longitudine capitis, gula nuda.

Falco *Tharus* cera, pedibusque luteis, corpore albo-nigrescente, vertice cristato.

Strix *Cunicularia* capite laevi, corpore supra fusco, subtus albo, pedibus tuberculatis pilosis.

PICAE.—Psittacus *Jaguilma* macrourus viridis, remigibus apice fuscis, orbitis fulvis.

Psittacus *Cyanalysios* brachiurus luteo-virens, collari caeruleo, uropygio rubro.

Psittacus *Chorus* brachyurus viridis, subtus cinereus orbitis incarnatis.

Picus *Lignarius* pileo coccineo, corpore albo, caeruleoque vittato.

Picus *Pitius* cauda brevi, corpore fusco maculis ovalibus albis guttato.

Trochilus *Cyanocephalus* rectirostris capite remigibus, rectricibusque caeruleis, abdomine rubro.

Trochilus *Galeritus* curvirostris viridi-aureus, remigibus, rectricibusque fuscis, crista purpurea.

Trochilus *Minimus* rectirostris, rectricibus lateralibus margine exteriore albis, corpore viridi nitente, subtus albiro.

ANSERES.—Anas *Melancorypha* rostro semicylindrico rubro, capite nigro, corpore albo.

Anas *Hybrida* rostro semicylindrico, cera rubra, cauda acutiuscula.

Anas *Regia* caruncula compressa frontali corpore caeruleo subtus fusco, collari albo.

Diomedea *Chilensis* alis impennibus, pedibus compedibus tridactylis, digitis omnibus connexis.

Diomedea *Chilensis* alis impennibus, pedibus compedibus tetradactylis palmatis, corpore lanuginoso cinereo.

Pelecanus *Thagus* cauda rotunda, rostro serrato, gula saccata.

GRALLAE.—Phaenicopterus *Chilensis* ruber, remigibus albis.

Ardea *Erythrocephala* crista dependente rubra, corpore albo.

Ardea *Galatea* occipite subcristato, corpore lacteolo, rostro luteo pedibus coccineis.

Ardea *Cyanocephala* vertice cristato caeruleo, remigibus nigris albo marginatis.

Ardea *Thula* occipite cristato concolore, corpore albo.

Tantalus *Pillus* facie, rostro, pedibusque fuscis, corpore albo, remigibus rectricibusque nigris.

Parra *Chilensis* unguibus modicis, pedibus fuscis occipite subcristato.

Otis *Chilensis* capite, juguloque laevi, corpore albo, vertice rectri cibusque cinereis, remigibus primor. nigris.

Struthio *Rea*, pedibus tridactylis, digito postico rotundato mutico.

PASSERES.—Columba *Melancoptera* cauda cuneata, corpore caerulescente, remigibus nigris.

Sturnus *Loyca* fusco, alboque maculatus, pectore coccineo.

Turdus *Thilius* ater, axillis luteis, cauda cuneata.

Turdus *Thenca* fusco-cinereus, subtus pallido-cinereus remigibus rectricibusque apice albis.

Turdus *Curaeus* ater niteus, rostro substriato cauda cuneata.

Fringilla *Barbata* lutea, alis viridibus nigro rubroque maculatis gula barbata.

Fringilla *Diuca* caerulea, gula alba.

Phitotoma (*gen. nov.*) rostrum conicum, rectum, serratum.

Nares ovatae.

1 Phitotoma *Rara*.

Lingua brevis obtusa.

AMPHIBIA.

REPTILIA.—Rana *Arunco* corpore verrucoso, pedibus palmatis.

Rana *Lutea* corpore verrucoso luteo pedibus subpalmatis.

Lacerta *Palluma* cauda verticillata longiuscula, squamis rhomboideis.

Lacerta *Aquatica Nigra*, (caudiverbera) cauda depresso-plana, pinnatifida, pedibus palmatis.

NANTES.—Chimæra *Callorinchus* rostro subtus labro inflexo lævi.

Squalus *Fernandinus* pinna ani nulla, dorsalibus spinosis, corpore tereti ocellato.

PISCES.

APODES.—Stromateus *Cumarca* dorso caeruleo, abdomine albo.

THORACICI.—Chaetodon *Aureus* cauda integra, spinis dorsalibus 11, corpore aureo, fasciis 5 discoloribus distincto.

Sparus *Chilensis* cauda bifida, lineis utrinque transversis fuscis.

ABDOMINALES.—Silurus *Luvur* pinna dorsali postica adiposa, cirris 4, cauda lanceolata.

Esox *Chilensis* maxillis aequalibus, linea laterali caerulea.

Mugil *Chilensis* dorso monopterygio.

Cyprinus *Regius* pinna ani radiis 11, dorsali longitudinali.

Cyprinus *Caucus* pinna ani radiis 13, corpore tuberoso argenteolo.

Cyprinus *Malchus* pinna ani radiis 8, corpore conico subcaeruleo.

Cyprinus *Iulus* pinna ani radiis 10, caudæ lobatæ.

INSECTA.

COLEOPTERA.—Lucanus *Pilmus* exscutellatus ater, corpore depresso, thorace striato.

Chrysomela *Maulica* ovata aurata, antennis caeruleis.

LEPIDOPTERA.—Papilio *Leucothea* D. alis integerrimis rotundatis albis concoloribus, antennis, aterrimis.

Papilio *Psittacus* N. alis dentatis virescentibus, luteo caeruleoque maculatis, subtus flavis.

Phalaena *Ceraria* B. elinguis, alis deflexis flavescentibus, fasciis nigris.

HYMENOPTERA.—Cynips *Rosmarini* Chilensis.

Tipula *Moschifera* alis incumbentibus cinereis, thorace, abdomineque flavis.

APTERA.---Aranea *Scrofa* abdomine semiorbiculato fusco, dentibus laniariis inferioribus exsertis.

Scorpio *Chilensis* pectinibus 16 dentatis, manibus subangulatis.

Cancer *Talicuna* brachyurus thorace orbiculato laevi integerrimi, chelis muricatis.

Cancer, *Xaivu* brachyurus, thorace laevi lateribus tridentato, fronte truncata.

Cancer *Apancora* brachyurus, thorace laevi ovato utrinque denticulato, cauda trigona.

Cancer *Setosus* brachyurus, thorace hirsuto obcordato tuberculato, rostro bifido inflexo.

Cancer *Santolla* brachyurus, thorace aculeato arcuato subcoriaceo, manibus pelliculatis.

Cancer *Coronatus* brachyurus, thorace obovato, apophyci dorsali crenata.

Cancer *Cementarius* macrourus, thoraci laevi cylindrico, rostro obtuso, chelis aculeatis.

VERMES.

MOLLUSCA.---Pyura *(gen. nov.)* Corpus conicum nidulans: Proboscides binae terminales perforatae. Oculi inter proboscides.

1. Pyura *Chilensis*.

Sepia *Unguiculata* corpore ecaudato, brachiis unguiculatis.

Sepia *Tunicata* corpore prorsus vaginante, cauda alata.

Sepia *Hexapodia* corpore caudato segmentato.

Echinus *Albus* hemisphærico globosus, ambulacris denis: areis longitudinaliter verrucosis.

Echinus *Niger* ovatus, ambulacris quinis: areis muricatis verrucosis.

TESTACEA.—Lepas *Psittacus* testa postice aduncа, sexvalvi, rugosa.

Pholas *Chiloensis* testa oblonga depressiuscula, striis longitudinalibus distantibus.

Solen *Macha* testa ovali oblonga antice truncata, cardine altero bidentato.

Chama *Thaca* subrotunda longitudinaliter striata, ano retuso.

Mytilus *Ater* testa sulcata postice squamosa.

Murex *Locus* testa ecaudata obovata antice nodosa, apertura edentula suborbiculata.

Helix *Serpentina* testa subcarinata imperforata conica, longitudinaliter striata, apertura patulomarginata.

REGNUM VEGETABILE.

DIANDRIA.

MONOGYNIA.---Rosmarinus *Chilensis* foliis petiolatis.

Maytenus *(gen. nov.)* Cor. 1 petela campanulata. Cal. 1-phyllus. Caps. 1 sperma.

1 Maytenus *Boaria.*

TRIANDRIA.

MONOGYNIA.---Scirpus *Ellychniarius* culmo tereti nudo, spicis globosis quaternis.

DYGINIA.---Arundo *Rugi* calyc. trifloris, foliis subulatis glabris.

Arundo *Quila* calyc. trifloris, foliis ensiformibus serratis.

Arundo *Valdiviana* calyc. trifloris, foliis subulatis pubescentibus.

TETRANDRIA.

MONOGYNIA.---Rubia *Chilensis* foliis annuis, caule subrotundo laevi.

Cornus *Chilensis* arborea, cymis nudis, foliis cordatis dentatis.

PENTANDRIA.

MONOGYNIA.---Nicotiana *Minima* foliis sessilibus ovatis, floribus obtusis.

Solanum *Cari* caule inermi herb. fol. pinnatis integ. nect. campanulato subaequante petala.

DIGYNIA.---Herniaria *Payco* foliis serratis.

Solsola *Coquimbana* fruticosa, caul. aphyllis, calyc. succulentis diaphanis.

Gentiana *Cachanlahuen* Cor. quinquefidis infundib. ramis oppositis patulis.

Heracleum *Tuberosum* fol. pinnatis, foliolis septenis, flor. radiatis.

Scandix *Chilensis* semin. rostro longissimo, foliolis integris ovatolanceolatis.

TRIGYNIA.---Quinchamalium *(gen. nov.)* Cal. 5-fidus. Cor. 5-fida. Caps. 3-loculatis polysperma.

Quinchamalium *Chilense.*

PENTAGYNIA.---Linum *Aquilinum* fol. alternis lanceolatis, pedunculis bifloris.

HEXANDRIA.

MONOGYNIA.---Peumus *(gen. nov.)* Cal. 6-fidus. Cor. 6-petala. Drupa 1-sperma.

1 Peumus *Rubra* fol. alternis, petiolatis, ovalibus, integerrimis.

2 Peumus *Alba* fol. alternis, petiolatis, ovalibus, dentatis.

3 Peumus *Mammosa* fol. alternis, sessilibus, cordatis, integerrimis.

4 Peumus *Boldus* fol. oppositis, petiolatis, ovalibus, subtus villosis.

Puya *(gen. nov.)* Petala 6 inæqualia, tribus major. fornicatis. Cap. 3-locularis.

1 Puya *Chilensis.*

OCTANDRIA.

MONOGYNIA.---Sassia *(gen. nov.)* Cal. 4-phyllus. Cor. 4-petala. Caps. 2-locularis, 2-sperma.

1 Sassia *Tinctoria* fol. ovatis, scapo multifloro.

2 Sassia *Perdicaria* fol. cordatis, scapo unifloro.

ENNEANDRIA.

MONOGYNIA.---Laurus *Caustica* fol. ovalibus rugosis, perennantibus, flor. quadrifidis.

Panke *(gen. nov.)* Cal. 4-fidus. Cor. 4-fida. Caps. 1-sperma.

1. Panke *Tinctoria* caule erecto racemifero.
2. Panke *Acaulis* racemo acauli.

Plegorhiza *(gen. nov.)* Cal. 6. Cor. 1-petala. Caps. 1-locularis, 1-sperma.

1. Plegorhiza *Gauicuru.*

DECANDRIA.

MONOGYNIA.---Hippomanica *(gen. nov.)* Cal. 5-partitus. Petala 5-ovata. Caps. 4-locularis.

1. Hippomanica *Insana.*

DIGYNIA.---Thuraria (*gen. nov.*) Cor. 1-petala. Calyc. tubulosus. Caps. 2-locularis, 2-sperma.

1. Thuraria *Chilensis.*

PENTAGYNIA.---Oxalis *Tuberosa* pedunc. umbelliferis, caule ramoso, radice tuberosa.

Oxalis *Virgosa* scapo multifloro, fol. ternatis ovatis.

ICOSANDRIA.

MONOGYNIA.---Cactus *Coquimbanus* erectus, longus, 10-angularis, angulis obtusis, spinis longissimis rectis.

Myrtus *Ugni* flor. solitariis, ramis oppositis, foliis ovalibus subsessilibus.

Myrtus *Luma* flor. solitariis, fol. suborbiculatis.

Myrtus *Maxima* pedunc. multifloris, fol. alternis subovalibus.

DIGYNIA.---Lucuma (*gen. nov.*) Cal. 4-fidus duplicatus. Cor. 6 Drupa 1-seu 2-sperma.

1. Lucuma *Bifera* fol. alternis, petiolatis, ovato oblongis.
2. Lucuma *Turbinata* fol. alternis, petiolatis, lanceolatis.
3. Lucuma *Valparadisæa* fol. oppositis, petiolatis, ovato-oblongis.

4. Lucuma *Keule* fol. alternis, petiolatis, ovalibus, subserratis.
5. Lucuma *Spinosa* fol. alternis sessilibus, ramis spinosis.

POLYANDRIA.

DIGYNIA.---Temus (*gen. nov.*) Cal. 3-fidus. Cor. 18-petala. Bacca dicocca.

1. Temus *Moschata.*

DIDYNAMIA.

GYMNOSPERMIA.---Ocymum *Salinum* fol. ovatis glabris, caule geniculato.

ANGIOSPERMIA.---Gevuina (*gen. nov.*) Cal. 6. Cor. 4-petala. Caps. 1-locularis coriacea.

1. Gevuina *Avellana.*

MONADELPHIA.

DECANDRIA.---Crinodendron (*gen. nov.*) Monogynia. Caps. 3-gona sperma.

1. Crinodendron *Patagua.*

DIADELPHIA.

DECANDRIA.---Phaseolus *Pallar* caule volubili, leg. pendulis, cylindricis, torulosis.

Phaseolus *Asellus* caule volubili, fol. sagittatis, semin. globosis.

Dolichos *Funarius* volubili caule perenni, legum. pendulis pentaspermis, fol. ovalibus utrinque glabris.

Psoralea *Lutea* fol. ternatis fasciculatis, foliolis ovatis rugosis, spic. pedunculatis.

POLYADELPHIA.

ICOSANDRIA.---Citrus *Chilensis* fol. sessilibus acuminatis.

SYNGENESIA.

POLYG. ÆQUAL.---Eupatorium *Chilense* fol. oppositis amplexicaulibus, lanceolatis, denticulatis, calycis quinquefloris.

Santolina *Tinctoria* pedunc. uniflor. fol. linearibus integerrimis, caulibus striatis.

POLYG. SUPERF.---Gnaphalium *Viravira* herb. fol. decurrentibus, spatulatis, utrinque tomentosis.

Madia *(gen. nov.)* Recept. nudum. pappus nullus: cal. 8-phillus: sem. planoconvexa.

1. Madia *Sativa* fol. lineari lanceolatis, petiolatis.

2. Madia *Mellosa* fol. amplexicaulibus lanceolatis.

POLYG. FRUSTR.—Helianthus *Thurifer* caule fructicoso, fol. line ari-lanceolatis.

MONOECIA.

TRIANDRIA.—Zea *Curagua* foliis denticulatis.

POLYANDRIA.—Colliguaja *(gen. nov.)* Masc. Cal. 4-fidus, cor. 6. Stam. 8.

Fem. Cal. 4-fidus. Cor. 6. Styli 3-Caps. angularis, 3-sperma.

1. Colliguaja *Odorifera.*

Quillaja *(gen. nov.)* Masc. Cal. 4-phyllus. Cor. 6. Stam. 12.

Fem. Cal. 4-phyllus. Cor. 6. Styli 4-Caps. 4-locularis. Sem. solitaria.

1. Quillaja *Saponaria.*

ADELPHIA.—Pinus *Cupressoides* fol. imbricatis acutis.

Pinus *Araucana* fol. turbinatis imbricatis hinc mucronatis, ramis quaternis cruciatis.

SYNGENESIA.—Cucurbita *Siceraria* fol. angulato sublobatis tomentosis, pomis lignosis globosis.

Cucurbita *Mammeata* fol. multipartitis, pomis sphæroideis mammosis.

DIOECIA.

DIANDRIA.—Salix *Chilensis* fol. integerrimis glabris, lanceolatis, acuminatis.

DECANDRIA.—Schinus *Huygan* fol. pinnatis: foliolis serratis petiolatis, impari brevissimo.

POLYGAMIA.

MONOECIA.—Mimosa *Balsamica* inermis fol. bipinnatis, partialibus 6-jugis subdenticulatis, flor. octandris.

Mimosa *Cavenia* spinis stipularibus patentibus, fol. bipinnatis, spicis globosis verticillatis sessilibus.

TRIOECIA.---Ceratonia *Chilensis* fol. ovalibus carinatis, ramis spinosis.

PALMÆ.

Cocos *Chilensis* inermis, frond. pinnatis, foliol. complicatis ensiformibus, spadicibus quaternis.

REGNUM LAPIDEUM.

PETRÆ.

CALCARIA.---Gypsum *Vulcanicum* particulis indeterminatis caerulescens.

ARGILLACEÆ.---Mica *Variegata* membranacea fissilis, flexilis, pellucida, variegata.

AGGREGATÆ.---Saxum *Chillense* impalpabile, luteum, maculis spatosis rubris caeruleisque.

MINERÆ.

SULPHURA.---Bitumen *Andinum* tenax ex atro caerulescens.

METALLA.---Cuprum *Campanile* mineralisatum stannosum cinereum.

Cuprum *Laxense* zinco naturaliter mixtum.

FOSSILIA.

TERRÆ.---Arena *Cyanea* ferri micans caerulea.

Arena *Talcensis* ferruginea in aqua durescens.

Argilla *Bucarina* fusca, luteo-punctata, odorifera.

Argilla *Maulica* nivea, lubrica, atomis nitidis.

Argilla *Subdola* atra, aquosa, tenacissima.

Argilla *Rovia* aterrima, tinctoria.

Calx *Vulcania* solubilis, pulvereo-granulata.

A SUPPLEMENT

TO THE

TABLE OF THE VEGETABLE KINGDOM,

CONTAINING SEVERAL SPECIES NOT INCLUDED THEREIN, AND DESCRIBED OR MENTIONED IN THIS WORK*.

Page 107---Chenopodium folio sinuato, saturate virenti, vulgo Quinua.

Page 108---Oxalis roseo flore erectior, vulgo Culle.

Page 109---Fragraria (Chilensis) fructu maximo, foliis carnosis hirsutis.

Page 113---Bermudiana bulbosa, flore reflexo cœruleo.

Alstroemeria (Ligta) caule ascendente. Hemerocallis floribus striatis.

Page 124---Tithymalus fol. trinerviis et cordatis, vulgo Pichoa.

Polygala cœrulea angustis et densioribus foliis. Clinclin.

Gramen bromoides catharticum. Guilno.

Virga aurea leucoi folio incano. Diuca-lahuen.

Lichnidea verbenœ tenui folio, folio. Sandia-lahuen.

Geranium columbinum, corecore.

Page 125---Jacobœa leucanthemi vulgaris folio, Gnilgue.

Page 127---Bochi liliaceo, amplissimoque, flore carmesino. Copiu.

Page 128---Urceolaria foliis carnosis scandens.

* It having been found difficult, from the imperfect descriptions of several of these species, to arrange them under their proper classes and orders, this collocation has been adopted in preference to any other.---*Trans.*

Coriaria (ruscifolia) fol. cordato-ovatis sessilibus. Deu.

Lonicera (corymbosa) corymbis terminalibus, fol. ovatis, acutis. Uthiu.

Poinciana spinosa, vulgo Tara.

Pseudo-acacia foliis mucronatis, flore luteo, Mayu.

Page 133—Psoralea glandulosa, fol. omnibus ternatis, foliolis ovato-lanceolatis, spic. pedunculatis, vulgo Cullen.

Page 135—Cestrum nocturnum floribus pedunculatis, vulgo Palqui.

Arbuscula 8-pedalis. Caules plurimi, fistulosi, erecti, teretes, aculeati, superne dichotomi. Folia alterna, petiolata, oblonga, integra, venosa, carnosa, 4-pollicarea. Flores corymbosi pedunculati. Calyx 5-fidus. Corolla brevior. Corolla monopetala, infundibuliformis, limbo plano 5-partito, flavescens. Bucca ovalis violacea.

Page 138—Datura arborea, pericarp; glabris inermibus nutantibus, caule arboreo. Floripondio.

Page 139—Boighe cinamomifera olivæ fructu.

SUPPLEMENTARY NOTES,

ILLUSTRATIVE OF

THE HISTORY OF CHILI,

Extracted from an anonymous work, entitled, A Compendium of the Geographical, Natural, and Civil History of Chili, printed in Bologna, 1776.

THE Spaniards have divided that part of Chili belonging to them, between the Andes and the sea, into fourteen provinces, to which may be added the Archipelago of Chiloé, the islands of Juan Fernandez, and the province of Cujo. Each of these, excepting Valdivia and the islands of Juan Fernandez, is the residence of a prefect called the *Corregidor,* who presides over the civil and military officers of his department, and on whom the Cabildo, or magistrate, is dependant. These provinces, commencing on the side of Peru, are:

1st. COPIAPO.

THIS province is bounded on the north by the deserts of Peru, on the east by the Andes, on the south by Coquimbo, and on the west by the Pacific Ocean. It is in length from north to south about one hundred leagues, and in breadth from east to west forty-four. It is watered by the rivers Salado, Copiapo, from whence it derives its name, Castagno, Totoral, Quebradaponda, Guasco, and Chollai. It abounds with gold, lapis lazuli, sulphur, and fossile salt, which is found in almost all the mountains that terminate it to the east. Its capital, of the same name, is situated upon the river Copiapo, in 26. deg. 50. min. S. latitude, and 305. 5. W. longitude.

It contains a parish, a convent of Mercedarii, and a college which formerly belonged to the Jesuits. On the river Guasco are situated the towns of Santa-Rosa and Guascoalto, both in 29 deg. of latitude, the first at four leagues distance from the sea, and the second in the neighbourhood of the Andes. This province has two ports, one at the mouth of the river Copiapo, and the other at that of the Guasco, which are known by the names of those rivers.

2d. COQUIMBO.

Coquimbo, bounded on the north by Copiapo, on the east by the Andes, on the south-east by Aconcagua, on the south-west by Quillota, and on the west by the sea, is forty-five leagues in length, and forty in breadth. Its rivers are the Coquimbo, Tongoi, Limari, and Chuapa. It is rich in gold, copper, iron, wine, olives, and other fruits, both those of European origin, and as such as are natural to the country. Its capital is Coquimbo, otherwise called *la Serena*, which was founded in the year 1544, by Pedro de Valdivia. This city is the residence of several noble and ancient families; it is pleasantly situated upon the river Coquimbo, in 29. deg. 49. min. of latitude, and 304. 22. of longitude. The fields around it are in a constant state of verdure, though it seldom rains there, and the temperature of the air is very mild. It has been several times taken and plundered by the English. Besides the parochial church, it contains several convents of monks of different orders, and a college formerly belonging to the Jesuits. There are two ports in this province, that of Coquimbo, near the mouth of the river of that name, at two leagues distance from the city, where some vessels from Peru load annually; and that of Tongoi, towards the confines of Quillota.

3d. QUILLOTA.

This province is bounded by that of Coquimbo on the north, on the east by Aconcagua, on the south by Melipilla, and on the west by the sea. It is twenty-five leagues in length, and sixteen in breadth. Its rivers are the Longotoma, Ligua, Aconcagua, and Limache. This district is one of the most populous and the richest in gold of any in Chili. Its hemp and honey are much esteemed. The capital, Quillota, or St. Martin, is situated in a pleasant valley on the borders of the river Aconcagua, in 32. 56. of latitude, and 304. 20. of longitude. It has a parish, with the churches of St. Dominick, St. Francis, St. Augustine, and a college formerly of the Jesuits. This province contains also the cities of Plazza, Plazilla, Ingenio, Casablanca, and Petrorca. This last is very populous, in consequence of the great number of miners who resort thither to work in the gold mines in its vicinity. It is situated on the river Longotoma, in 31. 30. south latitude, and 305. longitude. Quillota contains a number of ports, the most considerable of which are Papudo, Quintiro l'Erradura, Concon, and Valparaiso. The four first are not frequented; Valparaiso, or Valparadiso, the most commercial port of Chili, from whence all the trade to Spain and Peru is carried on, is in 32. 2. of latitude, and 304. 11. of longitude. The harbour is very capacious, and so deep that ships of the largest size can lie close to the shore. Its convenience for traffic, and the salubrity of its atmosphere, have rendered it a place of considerable population. A governor from Spain resides there, who has the command in the civil and military departments, and is amenable only to the president of Chili. Besides the college, which formerly belonged to the Jesuits, Valparaiso contains a parish church and several convents of monks. Upon the shore which forms the harbour is a well peopled town, three miles distant from Valparaiso, called *l'Almendral.*

4th. ACONCAGUA.

ACONCAGUA is enclosed between the provinces of Coquimbo, Quillota, Santiago, and the Andes. It is of the same size as Quillota, and is watered by the same rivers. It produces great quantities of grain and fruits, and much copper is procured from its mountains. The famous silver mines of Uspallata are situated in that part of the Andes corresponding to it. Its capital is Aconcagua, or St. *Philip*, upon the river of the same name, in 32. 48. of latitude, and 305. 50. of longitude. Besides a parochial church, it contains several convents of various religious orders, and a house which belonged to the Jesuits. Near the Andes is a village called Curimon, where the strict Franciscans have a numerous convent.

5th. MELIPILLA.

MELIPILLA is bounded on the north by Quillota, on the east by Santiago, on the south by the river Maypo, which divides it from Rancagua, and on the west by the sea. This province is of small extent upon the sea, but is about twenty-five leagues from east to west. Its rivers are the Mapocho and Poangue, and it abounds with wine and grain. Melipilla, or *St. Joseph de Logronno*, situated not far from the Maypo, in 32. 32. of latitude, and 304. 5. of longitude, is the capital. Although the situation of this place is beautiful, and the land near it very fertile, yet, from its vicinity to St. Jago, where the greater part of the proprietors reside, it is but thinly peopled. Notwithstanding, besides a parish church, the Augustines and the Mercedarii have establishments there, and the Jesuits had also a college. Near the river Mapocho is the town of St. Francis del Monte, so called from an ancient convent of Franciscans, around which a number of poor families having collected, formed the population of this place. In its vicinity

are several country houses belonging to some of the principal inhabitants of St. Jago. Not far from the mouth of the river Maypo is the port of St. Antonio; this was much frequented at an early period of the Spanish settlement, but since the trade has been transferred to Valparaiso, few or no vessels continue to load there.

6th. ST. JAGO, OR ST. JACOPO.

THE province of St. Jago is bounded by that of Aconcagua to the north, the Andes to the east, the river Maypo to the south, and Melipilla to the west. It is fifteen leagues in extent from east to west, and twelve from north to south, and is watered by the rivers Mapocho, Colina, and Zampa, and by several other beautiful streams. It also contains the lake Pudaguel, which is about three leagues in length. It is the most fertile of any part of Chili, producing great quantities of corn, wine, and fruits, particularly peaches, which in size and flavour surpass any others of the country. The mountains of Caren abound with mines of gold, and that part of the Andes which is attached to it with silver. But the chief importance of this province is derived from it being the seat of the capital of the kingdom, founded in 1541, by Pedro de Valdivia. This beautiful city, called St. Jago, stands on an extensive and delightful plain on the southern shore of the river Mapocho, which separates it from the suburbs of Chimba, Cannadilla, and Renca. It is supplied with water by a great number of aqueducts, which are carried to all the houses. On each side of the river, mounds of stone have been built as a security against inundations, and over it is a beautiful bridge that connects the city with the suburbs. It is situated in 33 deg. 31 min. south latitude, and in 305. 40. longitude, at the distance of thirty leagues from the sea, and seven from the Andes, whose lofty snow-clad heights form a beautiful contrast with the verdure of its scenery. The streets, like those

of all the other cities and villages in Chili, are straight and intersected at right angles, and are thirty-six geometrical feet in breadth. The great square is four hundred and fifty feet on each side. In the midst is a handsome fountain of bronze. The north side is occupied by the palaces of the presidents of the audience and of the city, beneath which are the public prisons. On the opposite side is the palace of the Count de Sierra-bella. On the western are the cathedra and the palace of the archbishop, and on the eastern three houses belonging to noblemen. The most remarkable edifices are the cathedral, the church of St. Dominick, and that of the great college formerly belonging to the Jesuits. The private houses are handsome and pleasant, but, on account of earthquakes, are usually of but one story. Besides the suburbs on the other side of the river, there is one to the south, called St. Isidore; it is very large, and separated from the city by a street four times as broad as the others, called *Cannada*. In the eastern part of the city is a hill, called *St. Lucia*, which formerly served as a fortress against the Indians. The inhabitants amount to forty-six thousand, and their numbers increase rapidly, in consequence of the great commerce of the place, which is very extensive in proportion to its population, as the houses are in general very commodious. The parochial churches are but four, the cathedral, St. Anna, St. Isidore, and Renca. There are, however, several convents of monks, two Dominican, four Franciscan, two Augustin, two of the Mercedarii, and one belonging to the Brothers of Charity with an hospital, besides seven nunneries, a house of correction for women, a foundling hospital, several private endowments, a college of nobility, which was under the direction of the Jesuits, and a Tridentine seminary. The Jesuits had likewise here a house of devotion, and three colleges with public schools, wherein were taught the various branches of learning. St Jago also contains a royal university, a mint for coining gold and silver, and barracks for the soldiers, who

are employed to maintain the police, and as guards to the president, and is the seat of the grand tribunals of the kingdom. The principal court is composed of twelve *Regidoers*, or perpetual senators, and of all the other officers who form the magistracy of the other cities of the country. It has a numerous nobility, consisting of several dignities of Castile, grandees, knights of the military orders of Spain, and honorary officers of his Catholic Majesty. Being the centre of all the commerce of Chili, it abounds with every convenience of life, and as all kinds of meat, fish, and other articles of food are obtained from the neighbouring provinces in great quantities; provisions are very cheap.

7th. RANCAGUA.

RANCAGUA is enclosed between the rivers Maypo and Cachapoal, and extends from the Andes to the sea. Its breadth between these rivers is very unequal, being from seventeen to only eight leagues. It is watered by the rivers Codegua, Chocalan, and several others that are of less importance; it contains also the lakes Aculeu and Bucalemu. The first, which is near the centre of the province, is about six miles in circumference, and the other, in the neighbourhood of the sea, is from six to seven leagues in length. From another lake, not far from the latter, large quantities of salt are obtained. The lands of Rancagua are very fertile, and produce much grain. *Santa Croce di Trianna,* or Rancagua, the capital, is in 34. deg. of latitude, and 305. 32. longitude. It has a parish church, a convent of Franciscans, and another of Mercedarii. Algue, a town recently founded, at eight leagues from the capital towards the sea-coast, has a very rich mine of gold.

8th. CALCHAGUA.

THIS province is situated between the rivers Cachapoal and Teno, and between the Andes and the sea. Its breadth from north to south, near the Andes, is twenty-five leagues, and near the sea, about fourteen. Its rivers are the Rio-clarillo, Tinguiririca, and Chimbarongo. In it are also the great lakes Taguatagua, and Caguil, the first of which is full of beautiful islands, and the other abounds with large clamps, that are highly esteemed. This province is very fertile in grain, wine, and fruits, and produces much gold. It forms a part of the district occupied by the Promaucians, a name signifying people of delight, derived from the beauty of the country which they inhabit. The capital is St. Ferdinando, which was built in the year 1742, not far from the pleasant river Tinguiririca, in 34. 18. deg. of latitude, and 305. 30. of longitude. Besides the parish church, it has a convent of Franciscans, and a college with a handsome church, which belonged to the Jesuits. The towns of Rio-clarillo, Malloa, and Roma, are also situated in the same province.

9th. MAULE.

MAULE is bounded on the north by Calchagua, on the east by the Andes, on the south-east by Chillan, the south-west by Itata, and on the west by the sea. This province is forty-four leagues long, and forty broad, and is watered by the rivers Lantue, Rioclaro, Paugue, Lircai, Huenchullami, Maúle, from which it derives its name, Putagan, Achiguema, Longavi, Loncomilla, Purapel, and others of inferior consideration. This province, as well as the preceding, abounds in grain, wine, fruits, gold, salt, cattle, and sea and river fish. The cheese made here is the best in Chili, and is no way inferior to that of Placentia or Holland. Its inhabitants, who are mostly the descendants of the valiant Promaucians, are courageous, robust, and warlike. The capital Talca, or St. Augustin, was

built in the year 1742. It is situated among hills on the river Rioclaro, in latitude 34. 47. and 304. 45. of longitude. Its population is very considerable, owing, not only to the rich mines of gold that are found in its mountains, but to the plentifulness of provisions, which are cheaper than in any other part of Chili. This latter circumstance has induced several noble families from St. Jago and Conception, whose finances had become diminished, to retire thither; an emigration which has been denominated, in derision, the bankrupt colony. It contains a parish, with convents of Monks of the Franciscan, Dominican, Augustin, and Mercedarii orders, and a college that belonged to the Jesuits. In this province are also the towns of Curico, Cauquenes, St. Saverio di Bella Isla, St. Antonio della Florida, Lora, and three or four other Indian villages. Curico, or St. Joseph of Bueno Vista, was built in the year 1742, and is situated in a pleasant plain at the foot of a beautiful hill, in 34. 14. degrees of latitude, and 305 degrees of longitude. It contains a parish church, a convent of Mercedarii, and another of strict Franciscans, which is very large. Cauquenes was built the same year, and lies in 35. 40. degrees of latitude, and in 304. 30. of longitude, between the two small rivers Tutuben and Cauquenes. Besides the parish church, it has a convent of Franciscans. St. Saverio di Bella Isla, and St. Antonio della Florida, were founded in the year 1755; the first is in 35. 4. degrees of latitude, and 304. 59. of longitude, and the second in 35. 20. of latitude, and 304. 41. of longitude. Laro, situate near the disemboguement of the river Mataquito, is a numerous settlement of Promaucian Indians, and is governed by a Cacique or Ulmen.

10th. ITATA.

THE province of Itata lies upon the sea-coast, between Maúle and Puchacay, and is bounded on the east by Chillan. From east to west it is twenty leagues in length, and from north to south eleven, and is intersected by the river Itata,

from whence it derives its name. The best wine of any in Chili is obtained from this province, which, from its being produced from lands belonging to the inhabitants of Conception, has received the name of Conception. Much gold is also found in the mountains, and in the sands of the rivers. Its capital, Jesus of Coulemu, is situated near the mouth of the river Itata, in 36. 2. degrees of latitude, and 305. 41. of longitude, and was founded in the year 1743.

11th. CHILLAN.

CHILLAN is bounded on the north by Maúle, on the east by the Andes, on the south by Huilquilemu, and on the west by the province of Itata. It is of the same extent as the preceding, and is watered by the rivers Nuble, Cato, Chillan, Diguillin, and Dannicalquin. This whole district is a plain, and very favourable to the raising of sheep, which are highly esteemed for their wool throughout the kingdom. Corn and fruits are also produced there in great quantities. The capital is called *St. Bartholomew of Chillan.* It was founded in the year 1580, and is situated on the river Chillan, in 36 degrees of latitude, and 305. 2. of longitude. It has been destroyed several times by the Araucanians, and in the year 1751 was overthrown by an earthquake. In consequence of this accident, the inhabitants transferred it the succeeding year to a more commodious site, and one less exposed to the inundations of the river. This city is well peopled, notwithstanding which it contains but one parish church, with convents of the Franciscan, Dominican, and Mercedarii orders, and a college which belonged to the Jesuits.

12th. PUCHACAY.

PUCHACAY is bounded on the north by the province of Itata, on the east by Huilquilemu, on the south by the river Bio-bio, and on the west by the sea. From north to south it

is twelve leagues in extent, and twenty from east to west. It is irrigated by the river Andalien and several other small streams. It produces gold dust in abundance, and also great quantities of strawberries both wild and cultivated, which are the largest in Chili. Gualqui, or *St. John the Baptist*, founded in the year 1754, upon the northern shore of the river Bio-bio, in 36. 44. degrees of latitude, and 304. 48. of longitude, is properly the capital, and the residence of the Prefect or *Corregidor*. This province comprehends the Prefecturate of Conception, which extends a little beyond the city of that name.

Conception, called in the language of the country *Ponco*, was founded, by Pedro di Valdivia, in a dell, or valley, formed on the sea-coast by some beautiful hills, in latitude 36. 42. and longitude 303. 23. This city is the second in the kingdom. At its commencement it flourished greatly, from the vast quantities of gold that were dug in its vicinity; but after the unfortunate battle of Marriqueno, in the year 1554, it was abandoned by Villagran the governor, and the inhabitants, on the approach of Lautaro, the Araucanian general, and by him taken and burned. It was, however, rebuilt in the month of November of the following year after a period of six months; but Lautaro, returning, again rendered himself master of it, slew in the assault the greater part of the garrison, and razed it to its foundations. Don Garcia de Mendoza, after his victories over Caupolican, restored it anew, and fortified it strongly. Having successfully resisted the attempt of the Araucanians to take it, who besieged it for fifty days, it continued to flourish in great splendour until the year 1603, when, with the other southern cities of the Spaniards, it was taken and burned by the Toqui Paillamachu. It soon, however, began to rise again from its ashes, and resume its former lustre, in consequence of the great commerce which was carried on there; and becoming more strong and populous than ever, the Araucanians ceased to molest it. But in the year

1730, a calamity of a new kind assailed it. It was almost totally destroyed by an earthquake, attended by an inundation of the sea, which overflowed the greater part, and swept away every thing that it met in its course. Notwithstanding these repeated misfortunes, the inhabitants obstinately resolved to persevere, and built it anew in a handsome manner, but did not enjoy it long; for, in the month of May of the year 1751, this devoted city was again destroyed by an earthquake and an influx of the sea, which entirely covered it. They fortunately escaped, and took refuge on the neighbouring hills, but continued for thirteen years in an unsettled state, not being able to agree among themselves in rebuilding the city. At length they resolved to abandon its former site, and founded a new city, at the distance of a league from the sea, in a beautiful plain, called Mocha, upon the northern shore of the Biobio. The Prefect, or Corregidor, is, at the same time, by the royal decree, commander of the army, this being the principal place for the rendezvous of the militia of the country. It has for many years been the residence of the camp-master-general, and of late that of the sergeant-major. The royal treasury in this place, from whence the soldiers of the frontiers, as well as those belonging to the city, are paid, is confided to the care of a treasurer, a cashier, and an inspector. The Audienza, or royal council, was first established in Conception, in the year 1567, but was afterwards abolished, and re-established some years after in the capital of St. Jago. The president is, however, obliged to reside in this city for six months, and has a palace in it built at the expense of the government. After the destruction of the city of Imperial, in the year 1603, it was erected into a bishopric. Besides containing convents of all the religious orders established in Chili, it has one of the sisters of the Trinity, a college which belonged to the Jesuits, with public schools, in which were taught the sciences of humanity, philosophy, and theology, a college of nobility, which was likewise under the direction of the Jesuits, and a Triden-

line seminary. The inhabitants, in consequence of so many misfortunes, scarcely amount at present to thirteen thousand. The temperature of the air is at all seasons very mild; the soil fertile, and the sea-coast abounds with every species of fish of the most delicious kinds, both scaled and testaceous. The harbour, or bay, is spacious, extending full three leagues and a half from north to south, and as many from east to west. The Quiriquina, a beautiful and fertile island, situated at its mouth, forms two entrances to it, the eastern of which, called *Bocca Grande*, is two miles wide, and the western, called *Bocca Chica*, is but a little more than a mile. The harbour affords good and safe anchorage for vessels of any burden, especially in a port called *Talcaguano*, where ships at present lie, as the new city is not far distant.

13th. HUILQUILEMU.

THE province of Huilquilemu, commonly called Estanzia del Rei, the royal possession, is situated between Chillan, the Andes, the river Bio-bio and Pucachay, and is in length and breadth the same as the preceding. Its rivers are the Itata, Claro, Laxa, and Duqueco. This district is rich in gold dust, and produces an excellent muscadel wine. The inhabitants are valiant and warlike, having been accustomed to fight with their formidable neighbours the Araucanians. The capital is called Estanzia del Rei, or St. *Lewis di Gonzaga*, and was built not many years since, near the Bio-bio, in 36 deg. 45 minutes of latitude, and 304. 48. of longitude. Besides the parish church there is an ancient college of the Jesuits. To protect this province from the incursions of the Araucanians, the Spaniards have erected, upon the shore of the Bio-bio, within their territory, the forts of Jumbel, Tucapen, St. Barbara, and Puren. Their barrier, however, is situated on the southern bank of that river, and consists of the forts of Arauco, Colcura, St. Pedro, St. Joanna, Nascimento, and Angeles.

14th. VALDIVIA.

THIS province is entirely separated from all the others possessed by the Spaniards in Chili, being situated in the midst of the country occupied by the Araucanians, which comprehends a tract of about seventy leagues in length. It lies upon the sea-coast, on both sides of the great river Valdivia, and on the south is bounded by the Guinchi, or *Cunchi*, who are in possession of its southern part. It is about twelve leagues long, and six broad, and abounds with valuable timber, and with gold dust, esteemed the purest of any in Chili. Its capital is the famous city, fortress, and port of Valdivia, situated on the southern shore of the river of that name, at three leagues distance from the sea, in 39. 58. degrees of latitude, and 305. 2. of longitude. This city was founded in the year 1551, by the conqueror Pedro de Valdivia, who gave it his name, and obtained immense sums of gold from its vicinity. Its wealth allured many inhabitants thither, and it became, even at its commencement, one of the most populous cities in the kingdom. It was twice besieged ineffectually by the Toqui Caupolican, but it was not so fortunate in resisting the talents and activity of the celebrated Paillamachu. In the year 1599 it was surprised at night by that general with four thousand men, who killed the greater part of the garrison, consisting of eight hundred soldiers, and, having burned the city, carried off a million in gold, and a valuable booty, consisting of the effects of the inhabitants, together with a great number of prisoners. The Spaniards, convinced of the importance of this situation, rebuilt it anew, and fortified it so strongly, that it resisted all the attempts of the Araucanians. It was, however, taken in the year 1640 by the Dutch, who, notwithstanding they were determined to keep it, were compelled to abandon it, being frustrated in their attempts to form an alliance with the Araucanians and the Cunchi, who even refused to supply them with provisions, of which they were in great want. The Spaniards,

who had fitted out a considerable fleet to retake it, finding it on their arrival abandoned, repaired and fortified it in a better manner than before, adding four strong castles or forts upon both sides of the river towards the sea, to defend it from foreign invasion, and another on the north, to protect it from the incursions of the Araucanians. These precautions have hitherto succeeded in securing it against external enemies, but it has suffered severely from fire, which has twice almost entirely destroyed it. The harbour is situated in a beautiful bay, formed by the river, and is the safest, the strongest from its natural position, and the most capacious of any of the ports in the South Sea. The island of Manzera, situated just in the mouth of the river, forms two passages, bordered by steep mountains, and strongly fortified. As this is a post of the most importance of any in the Pacific, a governor is always sent from Spain, who possesses reputation as a military officer, and is under the immediate direction of the president of the kingdom. He has under his command a considerable number of troops, who are officered by the five castellans, or commanders of the castles, a sergeant-major, a proveditor, an inspector, and several captains. For the pay of the soldiers thirty-six thousand crowns are annually sent hither from the royal treasury of Peru, and the provisions requisite for their subsistence from the other ports of Chili. The Jesuits had formerly a college here; there are besides some convents of Franciscans, and of the Brothers of Charity, with a royal hospital, and the parish church.

THE ARCHIPELAGO OF CHILOE

Is a great gulph or bay at the southern extremity of Chili, scooped out, as it were, in a circular form by the South Sea to the skirts of the Andes. This gulph extends from latitude 41. 20. to 44. 40. and from longitude 303. to 304. 50. The islands that it contains amount to forty-seven, of which thirty-

two have been peopled by the Spaniards or Indians, and the remaining are uninhabited. Among the former there is one that is very large, some that are of a moderate size, being from twelve to fifteen leagues in length, but the others are small. The large island, which is called Chiloé, has, in later times, communicated its name to the Archipelago, which was formerly known by that of Ancud. This island, whose western coast runs from north to south, the same course as that of the continent, is situated in the very mouth of the gulph, leaving only two passages, one of which, between its northern extremity and the shore of the continent, is little more than three miles in breadth; but the other, between its southern point and the foot of the Andes, is more than twelve leagues. This island is situated between the forty-first and a half, and the forty-fourth degrees of latitude, and is about sixty leagues in length, and twenty in its greatest breadth. The land, like that of all the other islands, is mountainous, and covered with almost impenetrable thickets. The rains are excessive, and only in the autumn do the inhabitants enjoy fifteen or twenty days of fair weather in succession. During any other season, were eight days to pass without rain, it would be esteemed a singular phenomenon. The atmosphere, of course, is very humid, and streams and rivers are to be found in every part. The air, notwithstanding, is very salubrious, and the temperature so mild, that it is never known to be either hot or very cold. Owing to the great degree of moisture, grain and fruits produce but very indifferently in these islands; the corn, however, that is raised there is sufficient for the supply of the inhabitants. Barley, beans, and flax, produce very well. Of kitchen herbs, the cabbage and garlic are the only ones that grow there. The grape never attains to maturity, and the same is the case with all other fruits, except the apple and some wildings. Beef, though not so plenty as in Chili, is by no means scarce. Horses, though not in such numbers as on the continent, are yet common, and there is scarcely a person

who is not the owner of one or two. Asses die in a short time after they are transported thither, whence there is not a mule to be found throughout the whole of the Archipelago. The animals that are met with in the greatest abundance are sheep and hogs, in which the inhabitants carry on a considerable trade. The wild animals, natural to the country, are deers, otters, and a species of black fox. Domestic fowls, as well as wild, are produced there in great numbers. In addition to these, the benevolent Author of Nature has, as an indemnity for those things of which they are destitute, provided all these islands with vast quantities of excellent fish of all kinds. Ambergris, of a superior quality, is also found there, and much honey, which is made by the wild bees. Wood is likewise very plentiful, and of a kind fitted for every sort of manufacture and ship-building.

This Archipelago was first discovered in the year 1558, by Don Garcia de Mendoza, governor of Chili, but no attempt was then made to conquer it. But in 1565, Don Martino Ruiz Gamboa was sent there, who, with only sixty men, subjected its inhabitants, to the number of seventy thousand, without experiencing the least resistance, and founded, in the principal island, the city of *Castro and the port of Chaca. These Indians, called Chilotes, remained submissive to Spain, until the present century, when they threw off the yoke, but were soon brought under subjection, through the conduct of general Don Pedro Molina, who was sent from Conception to reduce them to obedience. Although descended from the Chilians, whom they resemble in appearance, custom, and language, these people are extremely timid, and very docile. They are remarkable for their ingenuity, and readily acquire a knowledge of any thing to which they apply themselves. There are among them very expert carpenters, cabinet-makers,

* He called it so in honour of Lope Garcia de Castro, then Viceroy of Peru, and gave his own name, Gamboa, to the river which passes by it.—*E. E.*

and turners. In the manufacturing of flax and wool, they display much skill, and make beautiful bed-coverings from these materials, mixed with feathers, and also some cloths which they embroider with various colours. They have a strong attachment to a sea life, and become excellent sailors. Their barks, called piragues, consist of three or four large planks sewed together, and caulked with a kind of oakum or moss, collected from a shrub. These are very numerous throughout the Archipelago, and are managed with sails and oars, and voyages are often made in them as far as Conception. The Chilotes educate their sons well, and accustom them to labour at an early age. When taught, they make a rapid progress in learning. Some years since, a school was established for them in a village called Chonchi, into which one hundred and fifty were admitted, and all of them, in the space of a single year, were taught reading and writing, the first rules of arithmetic, the doctrines of Christianity, and the Spanish language. They were easily converted to Christianity, and they live in such strict regard to its duties, that the purity of the primitive church appears to be revived in them. Some tribes of savages have likewise settled in these islands, who have been persuaded by the missionaries to leave the Magellanic districts, in order to establish themselves in the Archipelago.

The government is vested in a governor, who is dependant upon the president of Chili, and resides at Chacao, a Cabildo, or magistrate, with his Prefect, or *Corregidor*, in the city of Castro, who have conjunctively cognizance of the private suits of the Indians, and a commandant in the island of Calbuco, situated in the northernmost part of the gulph. The Archipelago is divided into three parishes, dependant upon the diocese of Conception, the bishops of which, except one and a bishop *in partibus*, never go there, because of the danger of the voyage. It contains seventy-five towns, mostly inhabited by Indians, who are under the government of their Ulmenes,

in each of which the Jesuits had a missionary church. The two principal places are Castro and Chacao.

Castro, the capital of the whole Archipelago, is situated in the eastern part of the great island, upon an arm or gulph of the sea, in *42. 58. degrees of S. latitude, and 303. 15. of longitude. The houses, like those in all the other islands, are built of wood. The inhabitants, who are not †numerous, usually live upon their own possessions. Besides the parish church and the college, formerly belonging to the Jesuits, there is a convent of Franciscans, and another of Mercedarii, in which two or three monks reside. The port of Chacao lies nearly in the middle of the northern coast of the same island, upon the principal channel, which runs between that shore and the continent, in 42 degrees of latitude, and 307. 37. of longitude. This port has good anchorage, and is well defended from the winds, but the entrance is very difficult, owing in some measure to the currents and eddies that prevail in the channel, but principally to a rock that rises in the narrowest part of it, and is not visible except at ebb. The whole commerce of the Archipelago is carried on from this port, in four or five ships that come here annually from Peru, or from the ports on the continent of Chili. This traffic is entirely conducted by bartering the productions of the country for those articles that are brought, money being very scarce in these islands. Upon the arrival of the ships, the Cabildo, or magistrate of Castro, has the privilege of sending two deputies to tax the goods brought in them, and make an estimate of their prices, which is to regulate the sale. This trade, by the royal grant, is not subjected to the duties that are paid in the other ports.

* 42. 40. S. longitude 302, according to Agueros.—*E. E.*

† The constant residents are not more than one hundred and fifty. An earthquake ruined the city soon after its foundation, and there were few inducements to rebuild it.—*E. E.*

Agueros.

THE ISLANDS OF JUAN FERNANDEZ.

THESE islands are about one hundred and thirty leagues distant from the coast of Chili. They are situated in about 32. 42. degrees of latitude, and 297. 32. of longitude. The island of Fuera is about three miles in length; the land is very high, or rather a steep mountain, rising abruptly from the sea, having no harbours, or stations, where ships may remain secure, in consequence of the great depth of water that surrounds it. This island is full of beautiful trees and streams of good water, according to the information of the fishermen, who are in the habit of landing there. The island of Terra is eleven or twelve miles long by three broad. The land is principally mountainous, broken, and intersected by ravines, caused by the frequent torrents and streams which descend from the mountains. It abounds with excellent wood, among which are the sandal, the yellow wood, and the chonta, a species of the palm, which produces a fruit that is far from unpleasant; the wood of the trunk, which is hollow like a reed, becomes of a beautiful black, and is nearly as hard as iron. Lord Anson represents this island as a terrestrial paradise, but in reality its soil is infested with worms that destroy every thing. The coast abounds with lobsters, cod, and other fish, and with aquatic animals, in which its trade, which is very considerable, consists. This island was first discovered by Juan Fernandez, from whom it received its name, and who formed a settlement there, and brought over from the continent some goats that multiplied to an astonishing degree. After his death it was deserted, in which state it continued for some time; but the Spaniards perceiving of what importance to them the possession of these islands had become, in 1750 made a permanent establishment in that of Terra, and settled the port called Juan Fernandez, on the south-west coast. The president of Chili appoints its governor, who is usually one of the commanders upon the Araucanian frontier. Besides the

port of Juan Fernandez, there is another, lying towards the south, called the English harbour, from the circumstance of Lord Anson's squadron having anchored there; but it is insecure, being too much exposed to the winds.

CUJO.

Although Cujo is not strictly within the limits of Chili, yet as it is dependant upon the presidency of that kingdom, it will not be improper to take a brief notice of it in this account. It is bounded on the north by Tucuman, on the east by the Pampas, or deserts of Buenos Ayres, on the south by Patagonia, and on the west by the Andes, which separate it from Chili. Its length from east to west is one hundred and eleven leagues, and its breadth, from north to south, about one hundred and ten, being comprehended between the 29th and 35th degrees of latitude. In its temperature, as well as in the greater part of its productions, this province differs materially from Chili. The winter, although it is there the dry season, is very cold; in the summer the heat is excessive as well during the night as the day, and storms of thunder and hail are very frequent. In the western part of the province these storms commonly rise and disperse in the space of half an hour, and the heat of the sun, bursting with increased radiance from the clouds, in a few minutes dries up the moisture. In consequence of this sudden exsiccation, the land, if not watered by artificial means, becomes arid, and will bear neither grass nor trees, but when irrigated by canals, it produces almost every vegetable in astonishing abundance. The fruits and grains of Europe thrive there extremely well, and come to maturity a month earlier than in Chili, and the wines are rich and of an excellent body.

This province is intersected by three rivers from the Andes, that of St. Juan, and those of Mendoza and Tunujan. The two first receive their names from the cities that they lave, and after a course of from twenty-five to thirty leagues become

stationary, and form the celebrated lakes of Guanasache, which extend more than fifty leagues from north to south; and, at length, through a channel that receives the river Tunujan, lose themselves in the Pampas. These lakes abound with excellent trout and king-fish, and all the salt that is used in Cujo is obtained from them. The eastern part of this province, called la Punta, presents an appearance entirely different from the rest, and is watered by the rivers Contara and Quinto, and by several other streams. The plains are covered with beautiful trees, and the herbage grows to such a height, as in many places to conceal the horses; but thunder storms are more violent than in any other part of Cujo, and continue for hours accompanied with immoderate rain.

Of the trees of Cujo, one of the most remarkable is that called Palma, from its resembling, in its branches and fruit, the palm of Chili; it differs, however, in its height, which never exceeds eighteen feet, and in the manner of putting forth its branches, which are so near the ground as to prevent the trunk from being seen. Its leaves are hard, and terminate in a point as sharp as that of a sword. The fruit, though similar in appearance to the cocoa-nut, contains no kernel or substance that is edible, but merely a few round hard seeds. The most singular part of this tree is the stem, or trunk, which is very large. The outer bark is blackish, and is easily detached; this is succeeded by five or six interior layers, of so perfect a texture that they appear as if wrought in a loom. The first is of a yellowish colour, and of the consistency of sail cloth; the others regularly decrease in thickness, and become gradually whiter to the innermost, which is as fine and white as cambric, but of a looser texture. The thread of these cloths is strong and flexible, but not so soft to the touch as that of flax. Cujo also contains great quantities of the Opuntia, a species of Cactus that furnishes the cochineal. The natives have a practice of stringing these insects upon a thread with a needle, which communicates to them a blackish tint.

This plant produces a woolly fruit, of the size of a peach, of a glutinous substance, containing a great quantity of seeds. It is sweet and well flavoured, and is easily preserved by cutting it into slices, and drying them in the sun. The tree that produces the Greek or Turkey bean, is common throughout the province; it is of four kinds, two of which are good eating; of the others, one is used as provender for horses, and the other in making ink. Among the plants of Cujo is one that is very singular; it is called the *flower of the air*, from its having no root, nor ever being fixed to the earth. Its native situation is an arid rock, or a dry tree, around which it entwines itself. This plant consists of a single shoot, resembling the stock of the gillyflower, but its leaves are larger and thicker, and so hard that they seem to the touch like wood. Each shoot, or stalk, produces two or three white transparent flowers, in size and shape resembling the lily; they are full as odoriferous as that flower, and may be preserved fresh for more than two months on their stalks, and for several days when plucked off. But the most wonderful property of this plant is, that it may be transported without any difficulty for upward of three hundred miles, and will produce flowers annually if only suspended upon a nail.

This province abounds with birds, among which are two parrots that are different from those of Chili. The first is a little less than the turtle dove, and has a green back and whitish belly; the other, called *periquito*, is rather larger. Its plumage is a dark green, except the head, which is black, and a mixture of red upon the back. The partridges are of two kinds. The first, called *martinetta*, is of the size of a domestic fowl, has a beautiful tuft upon its head, and is adorned with handsome plumes of various colours; its flesh is very delicate, and its eggs are green. The common partridge is in great abundance, and so tame that a man with a reed, to which a snare is fastened, will take twenty or thirty of them in a few hours. The *abbanil*, or mason, so called from the manner of

constructing its habitation, is a snuff-coloured bird, of the size of a thrush; before it begins to build, it mixes clay very carefully with feathers and pieces of straw; then dividing it into little balls, carries them in its claws and bill to its mate, who first forms the bottom upon the trunk of a tree, into a circle of eight or nine inches in diameter, making it perfectly smooth; upon this it raises a wall about a hand's breadth in height, leaving a small aperture to go in at; it next proceeds to lay a second floor, which contains the nest, and also an opening communicating with the lower room; when this is completed, it continues the surrounding wall to the same height as the first, and covers the whole with a handsome arch. This edifice becomes, when dry, so firm as to resist the most violent winds and rain. In the northern parts of this province is a species of pheasant called *chunna*, which is as large as a hen, and of an ash colour; the flesh is as delicate as that of the European pheasant. This bird is easily domesticated, and performs in houses the office of a cat, freeing them from mice, which it eats very readily; but it is kept by few, on account of its disagreeable note, and a mischievous propensity of carrying away in its beak and concealing whatever it finds. Of turtle doves, besides the common species, there is one that is not larger than a sparrow. Ostriches are common, and bees are found every where, particularly in the eastern plains, and produce excellent honey. Grasshoppers appear there occasionally, in such numbers that they cover many miles of country, and destroy every green thing that they meet with; these are usually three inches in length, but they are sometimes to be seen as large as a pilchard, and from seven to eight inches long.

There are many animals in Cujo that are not to be found in Chili, as tigers, boars, stags, the land tortoise, the viper, Iguana, and several others. The tigers are ferocious, like those of Africa, and as large as an ass, but with shorter legs; the skin is mottled with white, yellow, and black. The inha-

bitants kill them with lances of five or six feet in length armed with a sharp iron. The method they adopt is for two persons to be in readiness, while a third, who has the spear, provokes the tiger, who rushes upon him with inconceivable fury, and impales himself upon the weapon, which the hunter keeps constantly directed towards him, when the two others come up and dispatch him. The Iguana is an animal of the lizard kind, about three feet in length; the colour is blackish, the eyes round, and the flesh white and tender. It feeds upon grass and wild fruits. The country people, who eat it, think its flesh far preferable to that of a chicken.

In the northern parts of this province are mines of gold and copper, but they are not worked, owing to the indolence of the inhabitants. There are also rich mines of lead, vitriol, sulphur, salt, coal, gypsum, and talc. The mountains in the neighbourhood of Juan are wholly composed of strata of white marble, from five to six feet in length, and from six to seven inches thick, which are regularly cut and polished by the hand of Nature. The inhabitants make from it a beautiful lime, and employ it in building bridges over their canals. Between the cities of Mendoza and La Punta, upon a low range of hills, is a large stone pillar, one hundred and fifty feet high, and twelve feet in diameter. It is called the giant, and contains certain marks or inscriptions, resembling Chinese characters. Near the Diamond river is also another stone, containing some marks, which appear to be ciphers or characters, and the impression of a man's feet, with the figures of several animals. The Spaniards call it the stone of St. Thomas, from an account which they pretend the first settlers received from the Indians, that a white man, with a long beard, formerly preached to their ancestors a new religion from that stone, and, as a proof of its sanctity, left upon it the impression of his feet, and the figures of the animals that came to hear him. This man they suppose to have been St. Thomas, from a tradition of his having preached in America.

The aboriginal inhabitants of Cujo, of whom there are at present but a few remaining, are called Guarpes, they are thin, brown, and of a lofty stature, and speak a different language from the Chilians. The Peruvians were the first who conquered these people, after having possessed themselves of the northern provinces of Chili. On the road over the Andes, from Cujo to Chili, are still to be seen some small stone edifices, erected for the accommodation of the officers and messengers of that empire. The first Spaniards who entered this province were commanded by Francis Aguirre, who was sent from Chili by Valdivia, and who quitted it on learning the death of that general. In the year 1560, Don Garcia di Mendoza sent thither Pedro Castillo, who subdued the Guarpes, and founded the cities of St. Juan and Mendoza.

Mendoza, the capital, is situated on a plain at the foot of the Andes, in 33 degrees 19 minutes south latitude, and in 308. 31. west longitude. The number of its inhabitants is estimated at six thousand. Besides the parish church, it contains a college which belonged to the Jesuits, convents of the orders of St. Francis, St. Dominick, St. Augustine, and the Mercedarii. This city carries on a considerable commerce in wine and fruits with Buenos Ayres; and its population is continually increased from its vicinity to the famous silver mine of Uspallata, which the inhabitants work to great profit.

St. Juan, which is forty-five leagues from Mendoza, is also situated near the Andes, in 31. 4. degrees of latitude, and 308. 31. of longitude. It has the same number of inhabitants, churches, and convents as Mendoza, and trades with Buenos Ayres, in brandy, fruits, and Vicugna skins. The pomegranates of its vicinity are greatly esteemed in Chili, for their size and sweetness. This city is governed by a Cabildo, and a Lieutenant of the Prefect, or Corregidor of Mendoza.

In the year 1596, the small city of La Punta, or St. Lodovico of Loyolo, was founded in the eastern part of Cujo; it received its name from Don Martin Loyolo, at that time go-

vernor of Chili, and is situated in 33. 47. degrees of latitude, and in 311. 32. of longitude, at the distance of about 62 leagues from Mendoza. Notwithstanding it is the thoroughfare of all the commerce between Chili, Cujo, and Buenos Ayres, it is a miserable place, and the inhabitants scarcely amount to two hundred. It has a parish church, one that belonged to the Jesuits, and a convent of Dominicans. The civil and military government of this city, as well as of its jurisdiction, which is very extensive and populous, is administered by a Lieutenant or Vicar of the Corregidor of Mendoza. Besides these cities, Cujo contains the towns of Jachal, Vallofertil, Mogna, Corocorto, Leonsito, Calingarta, and Pismanta, but these do not merit particular attention.

The Patagonians, who border upon Chili, and of whose gigantic stature so much has been written in Europe, from the most accurate information, differ not materially in this respect from other men. The Pojas, who form one of their tribes, live under the government of several petty princes, independent of each other. These people acknowledge the existence of a Supreme Being, and believe in the immortality of the soul. A singular kind of polygamy prevails among them, the women being permitted by their laws to have several husbands. As to the Cesari, the supposed neighbours of the Chilians, of whom such wonderful stories are told, they are merely an imaginary people, who have no existence but in the fancy of those who take a pleasure in the marvellous.

END OF VOL. I.

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